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Sorority Women & Eating Pathology: Communities of Unhealthy Body Standards?

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SORORITY WOMEN & EATING PATHOLOGY: COMMUNITIES OF UNHEALTHY BODY STANDARDS?

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ABSTRACT

The present study examined disordered eating, sorority social norms regarding the body and thinness, personal values regarding the body and thinness, body dissatisfaction, thin ideal internalization, fat talk, negative affect, and positive affect among sorority and non-sorority women. The aims of this study were to discern the underlying factor structures of the sorority/group social norms questionnaires and the personal values regarding the body and thinness questionnaire, investigate disordered eating among sorority and non-sorority women over time, and further examine the impact of social norms on sorority women's body and eating attitudes and behaviors. The results of this research illustrated three main findings. First, sorority women did not differ from non-sorority women on eating pathology. Second, fat talk, personal values regarding the body and thinness, and body mass index predicted increased disordered eating over time in the general college population of women. Third, the sorority and group social norms scale, as well as the personal values regarding the body and thinness measure, were all developed and showed evidence for validation in this research. Additionally, the sorority/group social norms questionnaires and the personal values regarding the body and thinness questionnaire demonstrated evidence for validation.

CHAPTER ONE

INTRODUCTION

Women in Western cultures often report struggling with issues of weight, appearance, and body image. Research indicates that women equate an ideal body with a thin body, as many have internalized the thin ideal that has been perpetuated through social pressures and sociocultural influences (Ahern, Bennett, Kelly, & Hetherington, 2010). Research also indicates that this thin ideal internalization is a key predictor of body dissatisfaction, with body dissatisfaction mediating the relationship between thin ideal internalization and disordered eating (Ahern et al., 2010; Stice & Shaw, 2002). A wide range of social and developmental factors are associated with eating disorder risk, including unrealistic and unhealthy social group body norms. Sororities are one social group that has been linked to eating disorders (e.g., Basow, Foran, & Bookwala, 2007; Rolnik, Engeln-Maddox, & Miller, 2010), but surprisingly little is known about the longitudinal effects of body and eating related group norms on disordered eating among those who participate in sororities. The present study used a quasi-experimental longitudinal design to investigate the development of thin ideal internalization, body dissatisfaction, and disordered eating in sorority women versus non-sorority women.

Women in college are especially at risk of developing eating pathology; it has been reported that sub-threshold levels of eating disordered behaviors are present in 67% of this population (Fitzsimmons-Craft, 2011). Among those in college, sorority women are at an even greater risk of developing eating disorders in comparison to the general

population of college women (Basow et al., 2007; Rolnik et al., 2010). Social influence and group norms have been hypothesized to play large roles in the development of harmful eating behaviors. Sororities are often described as fostering an environment with an emphasis on thinness and appearance, which is reified continually by the intense and close social interactions that develop among sorority members (Basow et al., 2007; Rolnik et al., 2010). It is therefore not surprising that sorority women have a greater fear of becoming overweight, diet more often, and are more weight-preoccupied than other college women (Schulken & Pinciaro, 1997).

Although it is clear that sorority women may be at a higher risk of developing disordered eating, it is unclear how the putative social influences that affect the development of disordered eating take effect. Social influence has been well-documented in the development of numerous unhealthy behaviors and psychopathology, such as drug and alcohol use (Hoffman, Monge, Chou, & Valente, 2007; Ostaszewski & Zimmerman, 2006). However, less attention has been paid to the effect of peer group norms on eating disorders (Oliver & Thelen, 1996; Paxton, 1996), despite evidence that body comparison to one's peers has been linked to dieting and unhealthy changes in eating habits (Schutz, Paxton & Wertheim, 2002). Given that college women are exposed to social pressures to conform to unrealistic body standards and society's *thin ideal*, it is crucial to investigate what mechanisms are in effect and how they can be better understood. It is particularly important to examine potentially harmful communities, such as sororities, since this research can be generalized to other groups of women who espouse unhealthy thinness norms.

The biopsychosocial model of mental health is a useful framework for conceptualizing the interaction of biological, psychological, and social factors in the development and maintenance of disordered eating (Borrell-Carrio, Suchman, & Epstein, 2004). The biological perspective includes genetic vulnerabilities, family correlates, structural and functional brain changes, and neurochemical alterations. The psychological approach describes factors such as body dissatisfaction that contribute to disordered eating. Finally, the social perspective incorporates sociocultural determinants of eating disorders, such as the internalization of the thin ideal. Particularly relevant to the present research are the psychological and social perspectives of the biopsychosocial model. Disordered eating is heavily influenced by psychological factors, such as body dissatisfaction (Jacobi et al., 2004). In turn, social processes, such as peer influence and the internalization of the thin beauty norm for women, affect these psychological factors (Dittmar, 2005; Leahy, Crowther, & Mickelson, 2007; Wood, 2006).

Within the social perspective, it is crucial to examine the sociocultural thin ideal, which has been associated with body and eating pathology (Ahern et al., 2010; Stice & Shaw, 2002). Social-cognitive mechanisms play a key role in the transmission of this thin ideal and its effects on disordered eating. The social-cognitive processes through which women come to espouse and internalize these thinness norms can be understood through social comparison theory and social identity theory. These theories take into account the influence of peers, which are a crucial component of the college environment. In tandem, applied to disordered eating in college women, these theories help explain the mechanisms of how peer influence impacts thin ideal internalization and disordered eating.

The present research is a quasi-experimental longitudinal study that included three data collection points across the academic year. Sorority and non-sorority women from two midwestern universities participated. The universities that participated in this study were Loyola University Chicago and Northwestern University. All sororities at each university were invited to participate in the study; three of the five sororities at Loyola University Chicago and two of the twelve sororities at Northwestern University chose to participate. Additional sorority members were recruited through online campus listservs. The control group for this study consisted of women at both universities who were not members of sororities, recruited through campus and class listservs. The survey used in this study consisted of measures of disordered eating, body dissatisfaction, sociocultural attitudes toward appearance (thin ideal internalization), fat talk, group identification, and social norms.

The present study used longitudinal statistical analyses to investigate the development of disordered eating in sorority women versus non-sorority women. Overall, this study investigated if sorority women are more at risk of developing body and eating pathology than non-sorority women. Additionally, social mechanisms regarding eating, thinness norms, and fat talk among sorority women and how these mechanisms influence body and eating pathology in the sorority population were examined. Finally, trajectories of disordered eating over time were demonstrated for sorority women versus non-sorority women.

In summary, this research examined two primary goals. First, it aimed to add clarity to the current literature regarding eating and body pathology in sorority women, which are a group of women who have been shown to emphasize thinness and

appearance, and who often engage in consistent, close social interactions. Group differences concerning body and eating pathology trajectories between sorority and non-sorority women were explored longitudinally. Second, social norms, group identification, thin ideal internalization, and social comparison were investigated as mechanisms through which disordered eating develops over time within sorority women. Specifically, social comparison and social identity theories were used as a framework to examine the mechanisms of how norms become influential to sorority women. Social identity theory was used to examine the relationship between group norms, group identification, thin ideal internalization, and disordered eating. Social comparison theory was used to consider the impact of group norms, thin ideal internalization, and fat talk – a form of proximal social comparison – on disordered eating.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Eating Pathology in Women

Although eating disorders and body dissatisfaction have long been topics of research, as well as prevention and intervention strategies, a disproportionate number of women still suffer from body and eating pathology. Women account for approximately 90% of those with eating disorders (American Psychiatric Association, 2000), and an estimated 0.9% of females suffer from Anorexia Nervosa, and 1.5% suffer from Bulimia Nervosa (Hudson, Hiripi, Pope, & Kessler, 2007). Furthermore, eating disorders have a high mortality rate; for Anorexia Nervosa, the mortality rate is approximately 6%, which is the highest of any mental disorder (Herzog et al., 2000).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) identifies two main types of eating disorders, Anorexia Nervosa and Bulimia Nervosa, as well as Eating Disorders Not Otherwise Specified. However, a large population of women also suffer from subclinical levels of eating disordered behavior, which is characterized by disordered eating that does not fully meet the criteria for an eating disorder diagnosis. The following sections will address the diagnostic criteria and clinical features of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders Not Otherwise Specified. Subclinical eating disordered behavior will also be discussed.

Anorexia Nervosa: Diagnostic Criteria & Clinical Features

Anorexia Nervosa is characterized by a dangerously low body weight, cognitive distortions regarding one's own body, and an intense fear of gaining weight. More specifically, the DSM-IV-TR (American Psychiatric Association, 2000) specifies four diagnostic criteria for Anorexia Nervosa: 1) weight loss leading to the maintenance of a body weight that is less than 85% of that expected for height, weight, and age, or alternatively, a failure to make the expected weight gain during periods of growth (e.g., adolescence) that leads to a body weight that is less than 85% of that expected, 2) intense fear of gaining weight or becoming fat even though underweight, 3) disturbance in thinking about one's body, including an overemphasis on weight or shape and denial of the seriousness of current low body weight, and 4) amenorrhea. Within the diagnosis of Anorexia Nervosa, two subtypes exist (American Psychiatric Association, 2000). The *restricting type* is characterized by weight loss/low weight maintenance that is achieved mainly through dieting, fasting, or excessive exercise. These individuals do not regularly engage in binge eating or purging. The second type is the *binge-eating/purging type*, in which the individual regularly exhibits binge-eating or purging behaviors (or both). Anorexia Nervosa has several associated features that include depressive symptoms, obsessive-compulsive features, and distorted feelings about oneself (including feelings of ineffectiveness and inflexible thinking).

Anorexia Nervosa typically begins in mid- to late adolescence and rarely occurs in women over age 40 (American Psychiatric Association, 2000). This psychiatric disorder has a highly variable course and outcome. Depending on the severity, hospitalization may be required in order to increase weight and fluid/electrolyte

imbalances. It is possible to have a full recovery from Anorexia Nervosa, although many exhibit a fluctuating pattern of weight gain and then relapse. Others will engage in chronic battle against the illness for the rest of their lives. Research suggests that approximately 50% of those diagnosed will recover, 30% will exhibit lingering features and behaviors that wax and wane throughout adulthood, and 10% will continue to have a chronic and unremitting course (Strober, Freeman, & Morrell, 1997; Sullivan, 1995). Ultimately, 6% will eventually die from Anorexia Nervosa.

The problems that result from Anorexia Nervosa are numerous and severe. Electrolyte imbalances, arrhythmias/other cardiac problems, anemia, abdominal pain, cold intolerance, lethargy, hypotension, and hypothermia can occur (American Psychiatric Association, 2000; Katzman, 2005). Additional problems include skin dryness, lanugo, skin yellowing, renal disturbances, osteoporosis, dental problems, and reduced estrogen/testosterone secretion (American Psychiatric Association, 2000; Katzman, 2005). Indeed, Anorexia is a serious psychiatric disorder that can induce vast complications throughout the body.

Bulimia Nervosa: Diagnostic Criteria & Clinical Features

Bulimia Nervosa is characterized by episodic binge eating in addition to the awareness that the eating pattern is abnormal, fear of not being able to stop eating voluntarily, a depressed mood, and self-deprecating thoughts following the eating binges (Pyle et al., 1983). In addition to binge-eating, individuals with this disorder commonly exhibit other behaviors in order to rid themselves of either the real or imagined excess weight. According to the DSM-IV-TR (American Psychiatric Association, 2000), five criterion must be present for an individual to be diagnosed with Bulimia Nervosa: 1)

recurrent episodes of binge eating characterized by both eating in a discrete period of time more food than most people would eat and a sense of lack of control over eating during the episode, 2) recurrent inappropriate compensatory behavior in order to prevent weight gain, 3) the binge eating and inappropriate compensatory behaviors both occur on average at least twice weekly for 3 months, 4) self-evaluation is unduly influenced by body shape and weight, and 5) the disturbance does not occur exclusively during episodes of Anorexia Nervosa. The DSM-IV-TR (American Psychiatric Association, 2000) specifies two types of Bulimia Nervosa; during the current episode, the *purging type* engages in regular use of self-induced vomiting, misuse of laxatives, diuretics, or enemas, whereas the *nonpurging type* uses other inappropriate compensatory behaviors such as fasting or excessive exercise, but has not engaged in self-induced vomiting or the use of laxatives, diuretics, or enemas.

The onset of Bulimia Nervosa typically occurs during late adolescence (Levine & Smolak, 2006) and further epidemiological studies indicate an especially high prevalence rate among female college students (Zalta & Keel, 2006). Disordered eating tends to persist for several years in many clinical samples, and periods of remission longer than one year are associated with a more positive long-term prognosis (American Psychiatric Association, 2000).

Numerous problems are associated with the binging and purging pattern of Bulimia Nervosa. Fluid and electrolyte imbalances, rotting of the teeth, swollen salivary glands, cardiac, and skeletal myopathies are common (American Psychiatric Association, 2000). Individuals with Bulimia Nervosa can also exhibit menstrual irregularity,

amenorrhea, and nutritional deficiencies. More severe complications include esophageal tears, gastric rupture, and cardiac arrhythmias.

Eating Disorder Not Otherwise Specified

Additionally, estimates indicate ten percent of females present with Eating Disorder Not Otherwise Specified (Levine & Smolak, 2006). Eating Disorder Not Otherwise Specified describes a diagnosis entailing symptoms of eating disorders that do not meet the criteria for any specific eating disorder (American Psychiatric Association, 2002). Examples of Eating Disorder Not Otherwise Specified include women who meet all of the criteria for Anorexia Nervosa but are in the normal weight range, or the regular use of inappropriate compensatory behavior by an individual in the normal weight range after eating small amounts of food.

Subclinical Eating Disturbances

Subclinical eating disorders describe pathology that entails symptoms of eating disorders, but not enough to meet the criteria for Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder Not Otherwise Specified (Franko & Amori, 1999). College women are especially prone to subclinical eating behavior; Franko and Amori (1999) found that 86% of college women are dieters. This statistic is problematic because dieting and subclinical disturbances can develop into full syndrome eating disorders. Indeed, one recent study found that unhealthy weight control practices and dieting predicted eating disorders five years later for women (Neumark-Sztainer, Wall, Guo, Story, Haines, & Eisenberg, 2006). Subclinical eating pathology has also been linked to other negative psychological outcomes such as higher levels of depression and dysfunctional cognitions (Franko & Amori, 1999).

Influential Factors in the Development of Disordered Eating Using a Biopsychosocial Framework

The biopsychosocial model of mental health examines the individual from a holistic perspective that takes into account the complex interaction among biological, psychological, and social factors in the development and maintenance of psychiatric disorders (Borrell-Carrio, Suchman, & Epstein, 2004). The biological perspective includes genetic vulnerabilities, family correlates, structural and functional brain changes, and neurochemical alterations. The psychological approach describes factors such as body dissatisfaction that contribute to disordered eating. Finally, the social perspective incorporates sociocultural determinants of eating disorders, such as the internalization of the thin ideal and social norms. These three approaches, which comprise the biopsychosocial model of eating disorders, will be discussed.

Particularly relevant to the present research are the psychological and social perspectives of the biopsychosocial model. Disordered eating is heavily influenced by psychological factors, such as body dissatisfaction (Jacobi et al., 2004). In turn, social processes, such as peer influence and the internalization of the thin beauty norm for women, affect these psychological factors (Ahern et al., 2010; Stice & Shaw, 2002). After a thorough discussion of the biopsychosocial model in the context of disordered eating, the psychological and social approaches will be the primary focus of this paper.

The Biological Perspective & Eating Disorders

The biological perspective of the biopsychosocial model for eating disorders includes genetic vulnerabilities, family correlates, structural and functional brain changes, and neurochemical alterations as factors that affect disordered eating. These biological

changes are complex, and are likely the result of a bidirectional relationship between one's body and the eating disorder.

Genetic vulnerabilities and family correlates have been a focus of eating disorder research for some time. Research from family studies has shown additive genetic effects for eating disorders (Bulik, Sullivan, Wade, & Kendler, 2000; Kendler, MacLean, Neale, Kessler, Heath, & Eaves, 1991; Wade, Bulik, Neale, & Kendler, 2000; Walters & Kendler, 1995). This literature suggests that polygenetic processes likely influence eating disorders; in other words, a number of irregular genes must come together in an individual to produce or predispose the individual to the disorder. Association and linkage studies of Anorexia Nervosa and Bulimia Nervosa are also beginning to identify genomic regions and candidate genes that may be implicated in the risk for these disorders (Bulik & Tozzi, 2004; Hinney, Friedel, Remschmidt, & Hebebrand, 2004). This research also suggests that genetic variants may make some individuals more vulnerable to environmental insults that lead to eating disorders. Another important familial factor is having a family member with a history of or current eating disorder diagnosis (Halmi, 2005). Specific individual biological factors that have been identified are early menarche and being mildly overweight in childhood (Halmi, 2005).

In addition to genetic vulnerabilities and family correlates, structural and functional brain changes have also been documented in individuals with eating disorders. Research suggests that there is reduced brain mass and enlarged ventricles in those with eating disorders, particularly Anorexia Nervosa (Dolan, Mitchell, & Wakeling, 1988; Palazidou, Robinson, & Lishman, 1990). Overall, it appears that gray matter loss is generalized rather than specific to particular brain regions. In addition to these structural

changes, patients with a current or past history of an eating disorder exhibit functional brain changes, including abnormal brain activation patterns and cognitive changes. The prefrontal cortex and anterior cingulate appear to be particularly implicated, and both show increased activity in eating disorder patients (Uher, Brammer, Murphy, Campbell, & Treasure, 2003). Cognitive changes, such as impaired decision making ability, social cognition, executive functioning, and a weakness in contextual integration (for example, being able to grasp the bigger picture) are common (Kaye 2000; Lopez et al., 2008; Southgate, Tchanturia, & Treasure, 2008).

Lastly, women diagnosed with eating disorders exhibit neurochemical abnormalities. Neurochemical findings suggest that the hypothalamic-pituitary-adrenal axis – a part of the neuroendocrine system that regulates bodily processes – may be crucial in eating disorders (Licinio, Wong, & Gold, 1996). The hypothalamus-pituitary-adrenal axis, also known as the *HPA axis*, allows interaction between the hypothalamus, pituitary gland, and the adrenal glands. The interaction of these structures aid in the regulation of mood, emotions, stress, and appetite; dysregulation results in malfunction in these systems.

In summary, eating disorders are complicated psychiatric illnesses that are associated with genetic vulnerabilities, family correlates, structural/functional brain changes, and neurochemical alterations. These brain changes may be due to the eating disorder, although the relationship between the changes and the illness are most likely bidirectional. The biological perspective regarding eating disorders is one facet of the biopsychosocial approach, and must be considered in tandem with the psychological and social perspectives. These two perspectives are considered next.

The Psychological Perspective & Eating Disorders

The broad literature on eating pathology demonstrates that there are numerous psychological risk factors that contribute to the development of eating disorders and subclinical disordered eating behavior. The following sections will discuss body dissatisfaction and other broad psychological factors that contribute to the development of eating disorders.

Research suggests that body image disturbance is common among women, (Gettelman & Thompson, 1993; Grogan, 1999). A large proportion of women tend to be dissatisfied with multiple aspects of their body shape and size, and are unhappy with their weight or appearance. Approximately 80% of women are reported to be dissatisfied with their appearance, and 49% are reported to be preoccupied with their weight (Cash & Henry, 1995; Smolak, Levine, & Streigel-Moore, 1996). It has been suggested that as many as one-third of women are trying to lose weight (Serdula, Williamson, Anda, & Levy, 1994). Because of the body dissatisfaction that women encounter, it is not surprising that many women engage in activities, such as maladaptive eating and exercise patterns, in order to change their body and appearance. It has been estimated that 40-50% of women are trying to lose weight at any point in time, with over forty billion dollars being spent on diet-related products each year in the United States (Smolak, Levine, & Streigel-Moore, 1996).

Body image disturbance is of clinical significance because it has been linked to various negative psychological outcomes, among which the most prominent are eating disorders and subclinical eating pathology (Anton, Perri, & Riley, 2000; Cash & Deagle, 1997; Ricciardelli, Tate, & Williams, 1997; Riva, Marchi, & Molinari, 2000; Stice, 2002;

Stice & Agras, 1998). Researchers suggest that approximately 35% of *normal dieters* will begin to exhibit disordered eating attitudes and behaviors, such as excessive calorie restriction, over-exercising, and binging/purging; of those, 20-25% will develop subclinical or clinical eating disorders (Shisslak, Crago, & Estes, 1995). Body dissatisfaction has been shown to be one of the most robust predictors of subclinical and clinical levels of disordered eating. The literature suggests two meditational models (for a review, see Stice & Shaw, 2002). The first model suggests that body dissatisfaction leads to increased dieting behaviors, which lead to an increased risk for the development of disordered eating. This first model is a *cognitive* model of body dissatisfaction in that it assumes that the idea of a dissonance between one's body and an ideal- along with a lack of self-esteem opportunities in other areas of the individual's life- leads to body dissatisfaction and disordered eating. The second model posits that body dissatisfaction is linked to increased negative affect, which elevates women's desire to engage in activities (i.e., excessive exercise or binging/purging) to reduce these negative thoughts and emotions regarding their body and appearance. The second model is an *affect* model of body dissatisfaction in that it assumes that the behavior of disordered eating is meant to manage the negative affect created by body dissatisfaction. While not all women who exhibit body dissatisfaction will develop maladaptive eating patterns, for some women this dissatisfaction is linked to an increased risk of developing future eating pathology and is a mechanism through which eating disorders can arise in women.

Other psychological risk factors in the development of eating disorders are low self-esteem (Stice, 2002; Wade & Lowes, 2002), adverse life events prior to onset (Horesh et al., 1995; Horesh et al., 1996), low interoceptive awareness (Leon et al.,

1995), higher levels of negative affect (Kitsantas et. al., 2010), sexual abuse (e.g., Wonderlich, Brewerton, Jocic, Dansky, & Abbott, 1997), and perfectionism (e.g., Bastiani, Rao, Weltzin, & Kaye, 1995; Fairburn et al., 1999, 1997, 1998; Kaye et al., 1998). In general, psychiatric disturbance and negative emotionality appear to be linked to eating disorders (see Jacobi et al., 2004 for a review), as well as having a negative self-concept and feeling ineffective. Impairments in identity formation have been speculated to play a role in the development of eating disorders (Schupak-Neuberg & Nemeroff, 1993). Dysfunctional family interactions, problematic family structures, attachment styles, and family psychopathology in general have also been linked to eating disorders (see Jacobi et al., 2004 for a review).

The Social Perspective & Eating Disorders

The social perspective is the third component of the biopsychosocial model of psychological functioning. The social forces associated with disordered eating have been broadly categorized as related to media, parents, and peers (Thompson, Coovert, & Stormer, 1999). In terms of media influences, the sociocultural theory of eating disorders connects disordered eating with cultural trends that promote thinness as the feminine beauty ideal, commonly referred to as the *thin ideal*. An extensive body of experimental, quasi-experimental, and correlational research now suggests that exposure to thin ideal media imagery portraying thinness as socially desirable has consistent and robust effects on body dissatisfaction and disordered eating (Stice & Shaw, 1994; Striegel-Moore & Bulik, 2007; Striegel-Moore, Silberstein, & Rodin, 1986). The pressure to conform to unhealthy beauty and thinness norms is the most detrimental when women internalize and accept the thin ideal, referred to as *thin ideal internalization* (Groesz, Levine, & Murmen,

2002). Thin ideal internalization has not only been found to correlate with body dissatisfaction and disordered eating, but also negative affect and low self-esteem (Groesz et al., 2002; Thompson & Heinberg, 1999).

Sociocultural messages that that affect disordered eating are likely transmitted through social-cognitive mechanisms (Corning, Krumm, & Smitham, 2006). Social Cognitive Theory (Bandura & Walter, 1963; Miller & Dollard, 1941) proposes that individuals actively interpret, shape, and reify the social worlds they encounter, and that both the individual and the environment interact in framing motivation. At the core of social cognitive theory is the principle of triadic reciprocality, which asserts that reciprocal interactions between the person, environment, and behavior are interrelated and inseparable (Bandura, 1986). Triadic reciprocality describes the mutual interaction among all of the causal factors of human behavior, although the relative influence of each factor depends upon the circumstances of the behavior and situation. Also important to social cognitive theory is modeling, which influences the transmission of information regarding group behavior; however, psychological and social factors impact whether this transmission of information will result in a particular behavior (Bandura, 1986). Lastly, social cognitive theory states that behavior developed as a result of various human capabilities, which include symbolizing, forethought, vicarious, self-regulatory, and self-reflective capabilities (Bandura, 1986).

Overall, social cognitive theory is a structure for understanding how individuals process complex social phenomenon. The thin ideal for women is one such social phenomenon that has a large impact on women's body image and consequent eating behavior. Processes within Social Cognitive Theory can be both passive and active in

nature. For example, the internalization of the thin ideal may be a passive process, whereas negative body talk among women – presumably an outward manifestation of this internalization – is a more active process.

Social Comparison Theory and Social Identity Theory are two examples of cognitive processes that help individuals make sense of themselves in relation to the social world and their place and value within it (Festinger, 1954; Turner & Brown, 1978). Whereas Social Comparison Theory is a comparative process, Social Identification Theory is identificatory in nature. Both of these processes are crucial components of the college context – a time when women are determining whom to associate with, how to process socio-cognitive messages regarding the body and thinness (i.e., thin ideal norms), and their associated behaviors.

Understanding these social-cognitive mechanisms of disordered eating is a crucial area of investigation (Tylka & Subich, 1999; Vitousek & Ewalk, 1993), given the prominent role of sociocultural factors in the development of disordered eating and the unique cognitive processes that often characterize women with eating disorders (Stice, Schupak-Neuberg, Shaw, & Stein, 1994; Viken, Treat, Nosofsky, McFall, & Palmeri, 2002; Vitousek & Hollon, 1990). These mechanisms are especially important to examine in college women because social interactions with peers (Bosari & Carey, 2001; Martin & Hoffman, 1993), as well as weight and shape (Berscheid, Walster, & Bohrnstedt, 1973; Cash & Green, 1986; Cook-Cottone, & Phelps, 2003; Fallon & Rozin, 1985), become increasingly salient and important in the college environment. As college is a time of uncertainty and transition, it is not surprising that the influence of peers and an increased value on appearance may be linked to the increase in disordered eating that is often found

in college women. In the next section, the unique social and developmental context of college will be examined, followed by a more lengthy discussion of the social-cognitive mechanisms of disordered eating in college women.

The unique social and developmental context of college. An increasing number of individuals are choosing to attend college, with approximately 60% of students going to college directly after high school graduation (Hamilton & Hamilton, 2006). The changes and challenges associated with the college experience have been linked to body dissatisfaction and eating disorders in women (Heatherton et al., 1995; Striegel-Moore et al., 1986). Given that the average age of onset of eating disorders is 18 years (Thelen et al., 1987), the relationship between the college context and eating disorders is worthy of investigation.

Although college is filled with numerous new opportunities and increased independence, it also is a time of new obstacles and increased stress (Cooley & Toray, 2001; Neumark-Sztainer, Story, Resnick, & Blum, 1997). Various researchers have identified college as an at-risk time period for the development or exacerbation of maladaptive eating patterns (Heatherton et al., 1995; Striegel-Moore et al., 1986) due to factors such as the college culture and environment (Striegel-Moore et al., 1986), high levels of stress (Freeman & Gil, 2004; Sassaroli & Ruggerio, 2005), and a fear weight gain (Delinsky & Wilson, 2008, p. 83). These dynamics all have been linked to the relationship between college and disordered eating behavior and body dissatisfaction. When considering the new stressors and changing environment in the transition from high school to college, women are faced with the challenge of actively interpreting, shaping, and reifying their new social worlds. Returning to the principles of Social

Cognitive Theory, women must choose with which groups they will identify, and how they interpret their environment and all of the social messages regarding the body and eating.

An alarming number of college women struggle with eating disorders and disordered eating behavior. While 4-9% of female college students meet the criteria for Anorexia Nervosa or Bulimia Nervosa (Drenowski, Yee, & Krahm, 1988; Pope, Hudson, Yurglen-Todd, & Hudson, 1984; Pyle, Neuman, Halvorson, & Mitchell, 1991), many more exhibit disordered eating attitudes and behaviors, as well as body dissatisfaction (Gray & Ford, 1985; Hesse-Biber, 1989). Mintz and Betz (1988) found that among college women, 38% report binging problems, 33% use laxatives or vomit at least once a month as a form of weight management, and 82% use one or more dieting behaviors at least daily; only 33% were considered to have normal eating habits. Other research reports that up to 90% of college students worry about their body image (Delene & Brogowicz, 1990). Specifically in the first year of college, 80% of women report dieting and 50% report binging (Striegel-Moore et al., 1990).

Social-cognitive mechanisms of disordered eating in college women. The college environment is filled with sociocultural messages regarding the body and thinness norms. As women face this time of stress, new challenges, and uncertainty, they may be more vulnerable to the influence of these unhealthy body standards. Research has shown the importance of sociocultural messages and thin ideal norms on body and eating pathology (Ahern et al., 2010; Stice & Shaw, 2002), and it appears that social-cognitive mechanisms play a key role in their transmission and effects on disordered eating. The social-cognitive processes through which women come to espouse and internalize these

thinness norms can be understood through *Social Comparison Theory* and *Social Identity Theory*. Both of these theories take into account the influence of peers, which are a crucial component of the college environment. In social comparison theory, peers serve as a point of comparison to evaluate oneself (Strahan, Wilson, Cressman, & Buote, 2006). In social identity theory, peers are used as a reference group for social norms and behavior, and as one's peer group becomes more important, the norms of this group become more important and influential on the individual's values and behaviors (Terry & Hogg, 1996). Together, applied to disordered eating in college women, these theories help explain the mechanisms of how peer influence impacts thin ideal internalization and disordered eating.

Social comparison theory. Social comparison theory dates back to Festinger's (1954) assertion that individuals engage in social comparisons with others in the environment as a way to obtain information when they are uncertain about their relative standing on a particular trait. Women tend to frequently engage in appearance focused social comparisons, as this is one method to gain information about one's relative physical attractiveness (Ridolfi, Myers, Crowther, & Ciesla, 2011). Since college is a time of uncertainty, and women are trying to determine their social and personal identities, social comparisons to other women are common.

Women can compare themselves to a variety of female targets, such as the media and peers. However, peers are more likely to be perceived as similar and relevant targets for comparison than women in the media in terms of attractiveness (Strahan, Wilson, Cressman, & Buote, 2006). Additionally, women are more likely to engage in social comparison with peers, whom they are frequently exposed to and are a seemingly

appropriate target for self-evaluation (Lin & Kulik, 2002; Wheeler & Miyake, 1992). Social comparison to peers has been shown to have more negative effects that comparison to the general population or idealized media images (Cattarin, Thompson, Thomas, & Williams, 2000; Halliwell & Dittmar, 2005; Heinberg & Thompson, 1992).

Among college women, frequency of social comparison with peers has been associated with body dissatisfaction and disordered eating (Bamford & Halliwell, 2009; Faith, Leone, & Allison, 1997; Hildebrandt, Shiovitz, Alfano, & Greif, 2008; Stormer & Thompson, 1996). Due to increased comparisons with thin ideal peers and associated diminishments in self-concept, Hesse-Biber and Marino (1991) assert that college women seem to be a more at-risk group compared to other females. Furthermore, frequent social comparison with peers tends to be in the upward direction and may be one pathway through which internalized sociocultural messages and pressures for thinness develop into body dissatisfaction and disordered eating (Dittmar, 2005; Leahy, Crowther, & Mickelson, 2007; Wood, 2006). In other words, appearance comparisons may mediate the relationship between internalization of the thin ideal and eating pathology for college women. Furthermore, by the time that women enter the college environment, the thin ideal internalization due to the media may have already taken effect during women's earlier development; the effects of this internalization may become intensified with the addition of proximal comparisons with other women.

One type of proximal social comparison, in the context of the greater distal social comparison that is characterized by women's tendency to internalize the cultural thin ideal, is women's tendency to engage in *fat talk.* Fat talk, also termed negative body talk, refers to women speaking with each other about their bodies in a negative manner

(Nichter & Vuckovich, 1994). Females in various social groups and at different ages engage in these weight and appearance focused conversations, regardless of their current body satisfaction (Nichter & Vuckovich, 1994; Smith & Ogle, 2006). Fat talk has been conceptualized as an attempt to fit in with one's social group and conform to perceived standards of behavior, particularly the notion of the internalization of the thin ideal among women.

Fat talk is more common among women with disordered eating than those with normal eating habits (Ousley, Cordero, & White, 2008). Researchers have suggested that women with disordered eating may have an increased focus on appearance (Cash, Melnyk, & Hrabosky, 2004; Cash & Labarge, 1996) and greater social comparison tendencies (Corning, Krumm, & Smitham, 2006). Although frequency of fat talk has been associated with increased body dissatisfaction (Salk & Engeln-Maddox, 2011), the directional nature of this relationship is unclear and the literature calls for more longitudinal research to clarify the nature of this association. Integrating the research on fat talk and social comparison theory, fat talk may be an active form of reification of existing schemata regarding thinness norms among women. In turn, this active participation in the thin ideal may be an illustration of Social Cognitive Theory and one of its core tenets, that people are active agents in the creation of personal and social values. As a result, fat talk may represent a tipping point experience for women that exacerbates body and eating pathology. Fat talk has been posited as a way that women relate to one another (Salk & Engeln-Maddox, 2011), and may be inherent in the development of in-group identification. The development of in-group identifications is

one of the social cognitive processes consistent with Social Cognitive Theory, and more specifically, Social Identity Theory.

Social identity theory. In addition to social comparison theory, social identity theory aids in understanding the social-cognitive mechanisms that make peer influences and thin ideal norms important to college women. One method in which individuals develop in-group identification are through norms. Peer influences and social norms are inherent in any group. Peer group norms have been shown to affect behaviors, especially for women who strongly identify with their group (Terry & Hogg, 1996). In other words, women who strongly identify with their peer group are more influenced by peer group norms than women who do not strongly identify with their peer group. According to social identity theory, group members develop a strong sense of identity with their group (Turner & Brown, 1978). As a group becomes more important to an individual, the individual tends to identify more strongly with the group and assimilate the values and behaviors of the group into his or her own personal values and behaviors (Terry & Hogg, 1996; Turner, 1999). In the context of the group, individuals form a social identity that is their self-definition in the group (Turner, 1999). This social identity is separate from one's personal identity (i.e., self-definition in terms of personal attributes); however, as the group becomes more salient, individuals tend to act in accord with the collective social identity rather than their personal identity (Terry & Hogg, 1996; Turner, 1999).

For individuals who strongly identify with their group, normative influence is an important predictor of individual behavior (Jetten, Postmes, & McAuliffe, 2002; Lapinski & Rimal, 2005; Smith & Terry, 2003). One example of this theory in the literature regards college students and exercise (Terry & Hogg, 1996). Peer group norms impacted

behavioral reports of exercising, but only for individuals who strongly identified with their group. For those who did not strongly identify with their group, personal attitudes were much more influential than group norms.

Peer influence is a powerful determinant of college students' behavior (Berkowitz, 2000). Friends are shown to be the most important comparison and evaluation group for appearance attitudes among college women (Heinberg & Thompson, 1992). The influence of peer groups has received extensive attention in the mental health literature, including drug and alcohol use (Hoffman, Monge, Chou, & Valente, 2007; Ostaszewski & Zimmerman, 2006). For example, the single best predictor of adolescent cigarette, drug, and alcohol use is peer use (Hoffman, et al., 2007; Ostaszewski & Zimmerman, 2006). However, far less attention has been paid to the effect of peer group norms on eating disorders (Oliver & Thelen, 1996; Paxton, 1996), despite evidence that peer dieting and weight concerns correlate significantly with disordered eating (Eisenberg, Neumark-Sztainer, Story, & Perry, 2005; Gerner & Wilson, 2005; Schutz & Paxton, 2007). If disordered eating peer group norms operate in similar ways to the other group norms in the mental health literature, they have the potential to have a profound impact on eating pathology. In the context of social identity theory, these norms will be particularly influential in college women, as they more strongly identify with their social groups over time.

Peer group influences and social norms. When women identify with a peer group that espouses unhealthy and harmful eating and body, it is not surprising that body and eating disturbances may occur. According to sociocultural perspectives on women's body image, women are exceptionally influenced by perceived beauty and thinness norms

(Heinberg, 2001; Thompson, Heinberg, Altabe, & Tantless-Dunn, 1999). Thinness is associated with life success and positive personality traits (Wade & DiMaria, 2003; Wade, Loyden, Renninger, & Tobey, 2003), whereas there is a strong negative stigma associated with obesity (Hebl & Heatherton, 1997; Hebl & Mannix, 2003). Specifically, for peer groups who endorse the thin ideal, members of these groups may be more at risk of developing body and eating pathology. The sociocultural emphasis on the thin female beauty ideal is associated with body dissatisfaction among women from childhood through adolescence and adulthood (Krahnstoever Davison, Markey, & Birch, 2003; Paquette & Raine, 2004). Thus, groups that espouse the thin ideal may engender body dissatisfaction, and in turn, disordered eating.

College women have a variety of peer groups wtih which they can identify (e.g., sororities, dorms, extracurricular activities). Messages concerning eating and dieting exert more influence over individuals when they are communicated via a group with which an individual identifies (Balaam & Haslam, 1998), and peers are one of the most influential factors in the development of body dissatisfaction among females (Presness, Bearman, & Stice, 2003). In one recent study, Schroff and Thomson (2006a, 2006b) found that peer influences were associated with females' internalization of the thin ideal and social comparison, which were then associated with body dissatisfaction, drive for thinness, and bulimic symptoms. Dieting behaviors of peers have also been associated with weight-related behaviors in women (Paxton, Schultz, Wertheim, & Muir, 1999; Pike, 1995). This influence of peers appears to intensify as more time is spent away from one's family and peer relations are strengthened (Collins & Laursen, 2000). Given this information about peer influence, it is not surprising that college is a period of risk in the

development of body dissatisfaction and eating disorders (Compas, Wagner, Slavin, & Vannatta, 1986; Vohs, Heatherton, & Herrin, 2001).

The college environment is one sociocultural context in which women are exposed to peer groups and social norms. Sororities are one type of peer group that many women encounter and join during college. The college environment is unique; for many women, this is the first time that they live independently and must build a new social support group. In the face of the uncertainty that women may feel in college, they may be more susceptible to the creation of new social norms, particularly regarding the body and eating. For those who choose to join a sorority, they may be especially at risk for developing unhealthy body norms, given that the thin ideal may be particularly pervasive in sororities (Rolnik et al., 2010).

How Does Sorority Membership Impact Body and Eating Pathology?

Although many women demonstrate eating disordered behavior in college, sorority women in particular have been conceptualized as having a preoccupation with body image and appearance (Basow, Foran, & Bookwala, 2007). As sororities are one community that may be integral to certain college women's identity, it is important to understand how they impact psychopathology. Sorority members show increased body image disturbance and body dissatisfaction compared to the general college population (Schulken & Pinciaro, 1997). Sorority women also show a greater fear of becoming fat, higher levels of weight preoccupation, and a larger concern for dieting than non-member college women (Schulken & Pinciaro, 1997). Women in sororities may also be more prone to eating disordered behavior than non-sorority women due to group pressures and social expectations (Alexander, 1998). A thin body ideal may be highly valued by

sorority members and the group pressures of a sorority may exacerbate the drive for this thin ideal.

Sorority women who live together may be particularly at risk for the development of eating and body pathology. The continuous exposure to other sorority women in the context of living together may facilitate greater social identity with the sorority, higher levels of group identification, and consequently, adherence to the sorority's social norms. Indeed, Hoerr and colleagues (2002) found that sorority women who lived together were at a particularly high risk for developing disordered eating than sorority women who did not live together or of students who lived together but were not sorority members. This research provides evidence that social influence and exposure to group norms may be prime facilitators in the development of maladaptive eating. When considering the sorority context and Social Cognitive Theory, it is understandable how an important social group to an individual's identity could have considerable negative impact on one's individual eating behaviors if the group espouses unhealthy and unrealistic thinness norms.

Sociocultural theories of disordered eating, which posits that pressure to conform to an unrealistically thin body is linked with the development of eating disorders and body image disturbance are especially relevant to sorority women. Research has shown that sorority members feel a high level of peer pressure to conform to the group standards and norms regarding one's body and appearance (Crandall, 1988; Paxton et al., 1999; Schultz, Paxton, & Wertheim, 2002). Given that many sorority members come to develop strong social identification with their sorority, these group norms and social messages regarding thinness and appearance could be detrimental to women's body image and

eating habits. Social influence research suggests that messages become influential as a result of the relationship between the message and the source (McGarty, Haslam, Hutchinson, & Turner, 1994; Turner, 1991). Furthermore, under certain conditions, people are motivated to seek agreement with people who are representative of an ingroup (a group seen as representative of the self in relation to a particular issue) (Turner, 1991). Perceived similarity between an individual and the ingroup source leads the individual to see the source as qualified to inform and validate their beliefs/values and thus reduce uncertainty about the nature of social reality (Turner, 1991). Sororities serve as communities that provide structure in the context of the college environment, which is a time of uncertainty. They allow the individual to create certainty with the establishment of the sorority in-group and the rest of the college population, which serves as the out-group. While identification with a group may be positive in certain situations, this identification may be detrimental when the group espouses harmful eating and body social norms (Basow et al., 2007; Crandall, 1988)

For many women, sorority membership may serve as a source of social influence, in which norms and values regarding the body/appearance are made evident to members. As more and more time is spent in a sorority, the members become the ingroup through which social messages and pressures are transmitted. Also, college is a transition period, in which uncertainty may lead to a vacuum filled by members of the sorority. The thin ideal may be emphasized, and members may be less likely to be self-determined in their beliefs and actions regarding the body. Additionally, as women spend more time with their sorority, this group has the potential to become a closed social circuit, preventing outside social influences (e.g., non-sorority friends or family) from influencing beliefs

about the body. Given the research suggesting that body dissatisfaction and disordered eating is higher in sorority members relative to other college students, it is plausible that sororities and the social processes and influences that often define one's experience as a member of a sorority have the potential to engender body and eating pathology. The current study aims to further examine the putative processes and influences through which these psychological problems develop.

Limitations of the Current Literature & Methodological Advances of the Present Study

The present research expands the literature on sorority women, one type of group that has a powerful social influence over college women. It is clear that group influence is a powerful motivator of individual behavior (Collins & Laursen, 2000). The literature on psychopathology such as alcohol and drug use has clearly linked group influence to the exacerbation of use and abuse (Hoffman, Monge, Chou, & Valente, 2007; Ostaszewski & Zimmerman, 2006), but little is known about group influence in relation to disordered eating (Oliver & Thelen, 1996; Paxton, 1996). Social norms are an important aspect of group influence, and the thin ideal beauty and appearance norm for women is evident (Groesz, Levine, & Murmen, 2002). Body dissatisfaction and thin ideal internalization, which are linked to this thin ideal, have been repeatedly associated with disordered eating in the literature (Groesz, Levine, & Murmen, 2002). Thus, an explicit examination between women's social norms and disordered eating is warranted and worthy of investigation.

Sororities are one group of women that are common on college campuses. It is evident that sorority women may be more at risk of developing eating pathology than the

general college population (Basow et al., 2007; Rolnik et al., 2010). However, to date, how social norms of sororities directly influence disordered eating has not been examined. Research has pointed to the vulnerability of sorority women for the development or exacerbation of body and eating pathology (Basow et al., 2007; Rolnik et al., 2010), but little is known about the mechanisms of action for why these problems occur.

In the available literature on sorority women and eating pathology, little is known about the longitudinal effects of sorority membership. Sorority members have been shown to have higher levels of disordered eating than non-members, exhibit increased binge eating over time, and espouse marked levels of body shame (Basow et al., 2007; Crandall, 1988; Rolnik et al., 2010). However, no study to date has examined multiple sororities, in comparison to a control group of non-sorority women, over the course of an entire academic year. This quasi-experimental design is necessary to draw more causal conclusions about the development and exacerbation of disordered eating in sorority women.

The current research will advance the literature in several ways. This study is the first to collect longitudinal data on sorority members before, during, and after sorority membership. From this data, more causal relationships can be established and moderation/mediation models were tested. Previous research has demonstrated that sorority membership has the potential to engender body and eating pathology; however, this study examined different components – specifically, social norms, group identification, body dissatisfaction, thin ideal internalization, fat talk, and disordered eating – of how and why this pathology develops. No current research to date has

examined women for an extended period of time with regard to sorority membership. Thus, the current research allowed for the longitudinal analysis of sorority membership. The long-term effects of sorority membership were examined. Additionally, this is the first study to explicitly explore the social norms in sororities regarding the body and appearance.

The Present Study

The current study examined disordered eating, sorority social norms regarding the body and thinness, personal values regarding the body and thinness, body dissatisfaction, thin ideal internalization, fat talk, negative affect, and positive affect among sorority and non-sorority women. The aims of this study were to discern the underlying factor structures of the sorority social norms questionnaire and the personal values regarding the body and thinness questionnaire, investigate disordered eating among sorority and non-sorority women over time, and further examine the impact of social norms on sorority women's body and eating attitudes and behaviors.

First, the underlying factor structures of the sorority social norms questionnaire and the personal values regarding the body and thinness questionnaire were examined. Both of these questionnaires included questions about how much the individual and the individual's sorority valued thinness, physical appearance, dieting, exercising, and fitting in with a social group. Principal axis factoring was used to assess the underlying factor structure for each questionnaire.

Second, hierarchical linear modeling assessed the effects of time, group (sorority versus non-sorority women), individual characteristics, and the interaction of individual characteristics on disordered eating. Specifically, the present study examined if sorority

women have higher initial levels of disordered eating than non-sorority women, as well as if sorority women's trajectory of disordered eating increased at a faster rate over time than non-sorority women. Individual characteristics that impact these trajectories of disordered eating over time was also investigated. These individual characteristics included personal values regarding the body and thinness, sorority values regarding body and thinness, thin ideal internalization, body dissatisfaction, fat talk, negative affect, and positive affect. The interactions of personal values by sorority values, sorority values by body dissatisfaction, and personal values by body dissatisfaction predicting disordered eating were also inspected.

Third, this study explored the social norms of sorority women and the impact of the norms on disordered eating using structural equation modeling. Specifically, in two separate models, it was examined if thin ideal internalization and fat talk mediated the relationship between social norms and the outcome of disordered eating among sorority women. It was also tested if these meditational models were moderated by level of identification to one's sorority or thin ideal internalization.

Research Questions & Hypotheses

Research questions and study hypotheses follow directly from the previous literature review.

Research questions: Factor structures of the sorority/group social norms and personal values regarding the body and thinness questionnaires. Two exploratory factor analyses were conducted to determine the underlying factor structures of the sorority social norms questionnaire and group social norms questionnaire. Because these scales were developed for this study, exploratory factor analyses are most appropriate to

determine the underlying factor structures of these questionnaires. These questionnaires include questions about participants' perception of their sorority or primary social group's thinness, physical appearance, dieting, and fitting in with a social group. The emergence of the underlying factor structures of these scales also would reveal if the sorority social norms questionnaire and the group social norms questionnaire have a comparable structure and are composed of the same factors.

A third exploratory factor analysis was conducted to determine the underlying factor structure of the personal values regarding thinness and the body questionnaire. As this scale was also created for this study, exploratory factor analysis is appropriate. An exploratory factor analysis was used to determine the underlying factors in the importance of participants' personal values for themselves regarding thinness, physical appearance, dieting, and fitting in with a social group.

Hypotheses 1 and 2: Sorority versus non-sorority women. The following hypotheses compare sorority women versus non-sorority women on their initial levels of disordered eating, disordered eating trajectories over time, and predictors of these outcomes. Figures 1, 2, and 3 depict these hypotheses.

1.1) It was predicted that sorority women will exhibit higher baseline levels of disordered eating than non-sorority women.

1.2) It was predicted that sorority membership will predict trajectories in disordered eating over time. Specifically, it was hypothesized that sorority members' disordered eating would grow at a faster rate over time than non-sorority members' disordered eating.

1.3) It was expected that personal values regarding the body and thinness, sorority/group norms regarding body and thinness, thin ideal internalization, body dissatisfaction, fat talk, negative affect, and positive affect would predict trajectories of disordered eating across the three time points. Specifically, it was predicted that higher levels of these variables (except positive affect) would be associated with higher levels of disordered eating. It was predicted that higher levels of positive affect would be associated with lower levels of disordered eating. Sorority/group social norms would not be included in these analyses if the exploratory factor analyses for these constructs did not reveal similar underlying factor structures.

If the sorority and group social norms questionnaires regarding the body and thinness revealed similar factor structures, the following hypotheses were proposed:

2.1) It was predicted that personal values would moderate the relationship between sorority/group norms and disordered eating. Those who experience high levels of sorority/group norms but have low personal values regarding the body and thinness would exhibit lower levels of disordered eating, compared to those who experience high levels of sorority/group norms and high levels of personal values regarding the body and thinness.

2.2) It was predicted that body dissatisfaction would moderate the relationship between sorority/group norms and disordered eating. Those who experience high levels of body dissatisfaction and high levels of sorority/group norms would exhibit higher levels of disordered eating compared to those who experience low levels of body dissatisfaction and high levels of sorority/group norms.

2.3) It was predicted that body dissatisfaction would moderate the relationship between personal values and disordered eating. Those who experience high levels of body dissatisfaction and high levels of personal values regarding the body and thinness would exhibit higher levels of disordered eating compared to those who experience low levels of body dissatisfaction and high levels of personal values regarding the body and thinness.

Hypotheses 3 and 4: Social-cognitive mechanisms & sorority women. The following hypotheses examine social-cognitive mechanisms that predict disordered eating in college women. Specifically, social norms, thin ideal internalization, sorority identification, and fat talk were used to predict disordered eating longitudinally. Two moderated mediation hypotheses were proposed. Figures 4 and 5 depict these hypotheses.

Moderated Mediation 1:

3.1) Over time, social norms of sorority women were expected to be associated with disordered eating, such that more body-focused social norms were associated with more disordered eating.

3.2) Over time, thin ideal internalization was expected to be associated with disordered eating, such that higher thin ideal internalization was associated with more disordered eating.

3.3) The impact of social norms on disordered eating was expected to be significantly reduced after controlling for the thin ideal internalization mediator variable.

3.4) The mediation relationship of social norms, thin ideal internalization, and disordered eating was expected to vary by level of identification to one's sorority. That is,

this relationship was expected to be significant for women who highly identify with their sorority, but not significant for women who do not highly identify with their sorority.

Moderated Mediation 2:

4.1) Over time, social norms of sorority women were expected to be associated with disordered eating, such that more body-focused social norms were associated with more disordered eating.

4.2) Over time, fat talk was expected to be associated with disordered eating, such that more fat talk was associated with more disordered eating.

4.3) The impact of social norms on disordered eating was expected to be significantly reduced after controlling for the fat talk mediator variable.

4.4) The mediation relationship of social norms, fat talk, and disordered eating was expected to vary by level of thin ideal internalization. That is, this relationship was expected to be significant for women who highly internalize the thin ideal, but not significant for women who do not highly internalize this ideal.

CHAPTER THREE

METHOD

Participants

Two hundred and fifty-one sorority women and 345 non-sorority women from two midwestern universities were recruited to participate in this study. The universities participating in this study were Loyola University Chicago and Northwestern University. All sororities at each university were invited to participate in the study; three of the five sororities at Loyola University Chicago (Phi Sigma Sigma, Kappa Kappa Gamma, and Alpha Sigma Alpha) and one of the twelve sororities at Northwestern University (Alpha Chi Omega) chose to participate. For the sorority chapters at these universities that declined participation, individual members were recruited through online campus listservs. The control group for this study consisted of women at both universities who were not members of sororities, recruited through campus and class listservs. All participation in this study was voluntary.

Participants ranged from first-year students to fourth-year students. From the sorority group, 18.3% were first-year students, 36.9% were sophomores, 23% were juniors, and 21.8% were seniors. For the non-sorority group, 56.2% were first-year students, 24.2% were sophomores, 9.5% were juniors, 9.5% were seniors, and 0.6% identified as other. The average age of the sorority group was 19.58 years (SD = 1.09), and the average age of the non-sorority group was 18.90 (SD = 1.36). The ethnic population breakdown for the sorority group was as follows: 87.6% Caucasian/White,

4.8% Asian American, 4.4% Hispanic or Latina, 0.4% African American, and 2.8% other. The ethnic population breakdown for the non-sorority group was as follows: 70.4% Caucasian/White, 13.9% Asian American, 9.3% Hispanic or Latina, 2% African American, 0.3 % American Indian or Alaska Native, and 4.1% other. For the sorority group, 70.8% identified as Christian, 7% as agnostic, 6.1% as atheist, 3.3% as Islam, 3.3% as Hindu, 2.4% as Jewish, 1.2% as Buddhist, and 5.8% as other. For the non-sorority group, 72.2% identified as Christian, 9.3% as Jewish, 6.9% as agnostic, 2.4% as atheist, 1.6% as Islam, 0.4% as Buddhist, and 7.3% as other. For the sorority group, 4.9% reported that their parent's income was less than $25,000, 16.3% reported between $25,000-$49,999, 20.1% reported between $50,000-$74,999, 16.3% reported between $75,000-$99,999, 14.5% reported between $100,000-$124,999, 8.1% reported between $125,000-$150,000, and 19.8% reported over $150,000. For the non-sorority group, 3% reported that their parent's income was less than $25,000, 4.3% reported between $25,000-$49,999, 7.3% reported between $50,000-$74,999, 12.9% reported between $75,000-$99,999, 20.2% reported between $100,000-$124,999, 16.3% reported between $125,000-$150,000, and 36.1% reported over $150,000. The average body mass index for the sorority group was 22.31 (*SD* = 2.97), and the average body mass index for the control group was 22.38 (*SD* = 3.10).

Procedure

This quasi-experimental longitudinal study included three data collection points. The data was collected through both paper and online surveys, detailed below. Opinio survey software was used to collect the online data; this software allows for secure,

online data collection in which participants can complete surveys on their own personal computer or computer on campus.

The recruitment phase of this study was completed in the summer and fall of 2011. Time 1 data collection was completed in fall 2011, time 2 data collection was completed in winter 2012, and time 3 data collection was completed in spring 2012. Researchers obtained paper survey responses from the four sororities who agreed to participate in this study as a chapter. Survey responses for all of the additional sorority women, as well as the control group of non-sorority women, were collected online through Opinio survey software. Participants were compensated for their participation with raffle prizes funded through Loyola.

Measures

All measures are included in Appendix A.

Disordered eating behavior. The Eating Attitudes Test (EAT-26; Garner et al., 1982) consists of 26 items assessing eating disorder symptomology. The EAT consists of a continuous measure detailing eating disordered behavior that can be applied to non-clinical populations. Participants are asked to indicate how often they agree (e.g. *always, usually, often, sometimes, rarely, never*) with statements regarding their eating habits, weight and appearance (e.g., "I am preoccupied with the thought of fat on my body" and "I like my stomach to be empty."). Higher scores indicate higher levels of disordered eating behavior. This scale correlates with measures of body dissatisfaction and successfully discriminates Bulimia Nervosa participants from normal participants (Gross et al., 1986; Mazzeo, 1999; Tylka & Hill, 2004). Internal consistencies for this measure are reported to range from .83 to .90 (Garner, Olmstead, Bohr, & Garfinkel, 1982).

Body dissatisfaction. The Body Dissatisfaction scale of the Eating Disorder Inventory-2 (Garner, 1991) measures dissatisfaction with the size and shape of different areas of the body. Participants are presented with a nine-item Likert scale that ranges from *always* to *never* and are asked to rate how often they agree with the statements (e.g., "I think that my thighs are too large"). Higher scores are indicative of elevated levels of body dissatisfaction. This subscale correlates with eating disordered symptomology and the Eating Attitudes Test (Spillane, Boerner, Anderson, & Smith, 2004). Internal consistency has been reported as .90 (Garner, Olmstead, & Polivy, 1983).

Sociocultural attitudes toward appearance (thin ideal internalization). The Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Beg, Roehrig, Guarda, & Heinberg, 2004) is a 30-item measure assessing internalization of the thin ideal. It is a continuous measure assessing the influence of general media and athletic/sports figures on the internalization of the thin ideal. The SATAQ-3 extends previous versions, SATAQ-Revised (SATAQ-R; Cusumano & Thompson, 1997) and original SATAQ (Heinberg, Thompson, & Stormer, 1995), to include the media's more recent focus on athleticism and sports and to examine media influences beyond internalization of the thin ideal. The SATAQ-3 has three subscales, internalization, information, and pressures, however, the internalization subscale is further divided into general and athlete subsections. Each subscale has demonstrated good internal consistency, with an alpha of 0.96 for the information subscale, 0.92 for the pressures subscale, 0.96 for the general internalization subsection, and 0.95 for the athlete internalization subsection (Thompson et al., 2004). The SATAQ-3 has shown predictive validity over and above another measure of the internalization of the thin ideal, the Ideal

Body Internalization Scale-Revised (ISIB-R; Stice, 2001; Stice & Agas, 1998; Stice & Bearman, 2001), and converges with measures of body image and eating disturbance (Thompson et al., 2004).

Social norms regarding the body and thinness. Social norms regarding the body and thinness were measured through two scales created for this study. For each scale, on a seven-point Likert scale ranging from *not at all* to *very much*, participants were asked to rate how much they personally value, as well as how much their sorority/social group values, the following items: *thinness, physical appearance, dieting, exercising,* and *fitting in with a social group*. These items were chosen based on their relevance to the thin ideal and sociocultural thinness standards for women (Ahern et al., 2010; Stice & Shaw, 2002).

Negative body talk (fat talk). Fat talk, also described as negative body talk, was assessed using the Negative Body Talk Scale (Engeln-Maddox, Salk, & Miller, 2012). The Negative Body Talk Scale is a 13-item measure that assesses women's tendency to engage in negatively-valenced commentary about their body weight and shape when speaking with others. Participants are presented with this measure that is composed of a Likert scale that ranges from *never* to *always* and are asked to rate how often they say certain negative comments about their bodies (e.g., "I feel fat"). Higher scores are indicative of higher levels of negative body talk/fat talk. This scale has been validated on a college sample of women, and positively correlates with one's tendency to engage in physical appearance-related comparisons (Engeln-Maddox, Salk, & Miller, in press). Cronbach's alpha has been reported as .93 (Engeln-Maddox, Salk, & Miller, in press).

Positive and negative affect. Positive and negative affect were measured with the Positive and Negative Affect Schedule (PANAS; Watson & Clark, 1994). This measure consists of two, ten-item scales that measure levels of positive and negative affect, which are the dominant dimensions of emotional experience. Positive affect is measured with items such as *interested, excited,* and *strong*, while negative affect is measured with items such as *distressed, nervous,* and *scared*. Participants indicate the extent to which each item describes how they feel in general. Higher scores on the positive items of the PANAS indicate a positive emotional state; higher scores on the negative items of the PANAS indicate a negative emotional state. PANAS scores show strong correlations with other measures of mood states (Watson & Clark, 1994). Reported internal consistencies range from .83 to .90 for the positive affect subscale and .79 to .93 for the negative affect subscale (Watson & Clark, 1994).

Sorority/group identification. For sorority women, sorority identification was measured through a seven-point Likert scale ranging from *I do not identify with my sorority at all* to *I identify with my sorority very much*. For non-sorority women, primary social group identification was measured through a seven-point Likert scale ranging from *I do not identify with my primary social group at all* to *I identify with my primary social group very much.*

Demographic items. Information on the following demographic variables was collected: gender (all participants should be female), age, ethnicity/race, year in school, socioeconomic status, religious affiliation, whether they are a member of a sorority, and height/weight.

Planned Analyses

Exploratory factor analysis. Exploratory factor analysis was used on the data to discern the underlying factor structure of the sorority social norms questionnaire. A second factor analysis was conducted to determine the factor structure of the personal values regarding the body and thinness questionnaire. Principal axis factoring with direct oblimin rotation was used to examine this factor structure, according to recommendations on use of factor analysis for scale creation (e.g., Gorsuch, 1997; Preacher & MacCallum, 2003). Principal axis factoring uses communality coefficients in the diagonal of the correlation matrix. The extraction method in principal axis factoring usually begins with principal components analysis, with the communality coefficients from principal components analysis being used to replace the values on the diagonal of the initial correlation matrix (Gorsuch, 1974; Thompson, 2004). A set of factors and corresponding communality coefficients are then extracted, and this process continues until the communality estimates stabilize (i.e., iteration). The variance of each item is assumed to be both item communality and unique item variance. Principal axis factoring uses communality estimates in the diagonal of the correlation matrix that are iteratively estimated until convergence.

The process of moving the factor axes that measure the location of the measured variables in the factor space in order to elucidate the nature of the underlying constructs and obtain simple structure is called factor rotation (Thompson, 2004). Three properties define simple structure: 1) each variable should have at least one loading near zero on at least one of the factors, 2) for each factor there should be at least as many variables with near-zero loadings as number of factors, and 3) for each pair of factors, there should be at

least a few variables that load onto only one variable. Variables should be high loaders, defined as 0.40 and above in the rotated components matrix, on a single factor (Bryant & Yarnold, 1995). As mentioned, the direct oblimin rotation will be used, which is a standard method for a non-orthogonal (oblique) solution (Gorsuch, 1983). In other words, in the direct oblimin rotation, the factors are allowed to correlate. Simple structure is achieved by applying this rotation method.

To determine the appropriate number of factors from the results of the principal axis factoring, two stopping rules were used. Kaiser's stopping rule (1960) retains all factors with eigenvalues of at least 1, which is the variance of a single standardized variable (Bryant & Yarnold, 1995). Cattell's scree test (1966) determines the appropriate number of factors to extract by plotting the eigenvalues (Y axis) by factor (X axis). The factors prior to the point of inflexion on the curve of the scree plot are kept; the factors in the gradual descent are dropped.

In addition to the stopping rules, parallel analysis was used to identify how many factors to retain (Kahn, 2006; Zwick & Velicer, 1986). In this technique, random sets of data with dimensions matching those of the actual dataset are generated and factor analyzed. Factors from the actual data with eigenvalues larger than those from the randomly generated data are retained. Parallel analysis in this study was conducted using Watkins' (2006) MonteCarlo program.

Hierarchical linear modeling. Hierarchical linear modeling (HLM) allows researchers to examine individuals nested in various types of groups (Raudenbush & Bryk, 2002). HLM is useful for determining the effects of variables at different levels and permits a separation of within-group and between-group phenomena, while allowing for

simultaneous consideration of the effects of group characteristics on group means and on relationships within groups. This clustered data incorporates predictors at the individual and group levels, as well as individual by group interactions. In this study, HLM was used to examine the effect of time, sorority membership, and individual characteristics on disordered eating.

The present hierarchical linear model consisted of two levels, predicting the outcome of disordered eating. The first level was time (months); all three time points were incorporated into this analysis. The second level included time invariant data at time 1, such as group (sorority members versus non-sorority members), individual characteristics, and the proposed interactions involving specific individual characteristics. The individual characteristics included personal values regarding the body and thinness, sorority values regarding body and thinness, thin ideal internalization, body dissatisfaction, fat talk, negative affect, and positive affect. The interactions of personal values by sorority values, sorority values by body dissatisfaction, and personal values by body dissatisfaction predicting disordered eating were also be incorporated into this analysis. Figures 1, 2, and 3 depict these analyses.

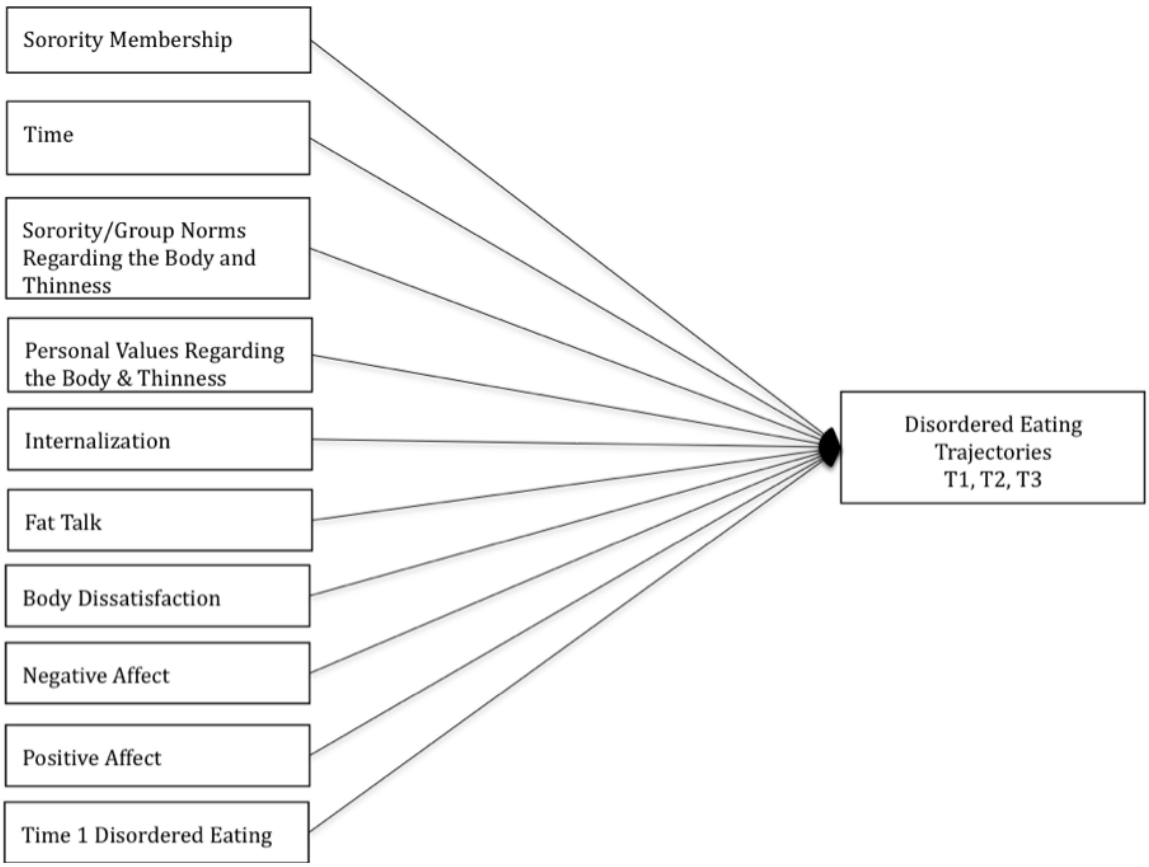

Figure 1. Hierarchical linear modeling main effect variables predicting disordered eating trajectories (level 2 predictors).

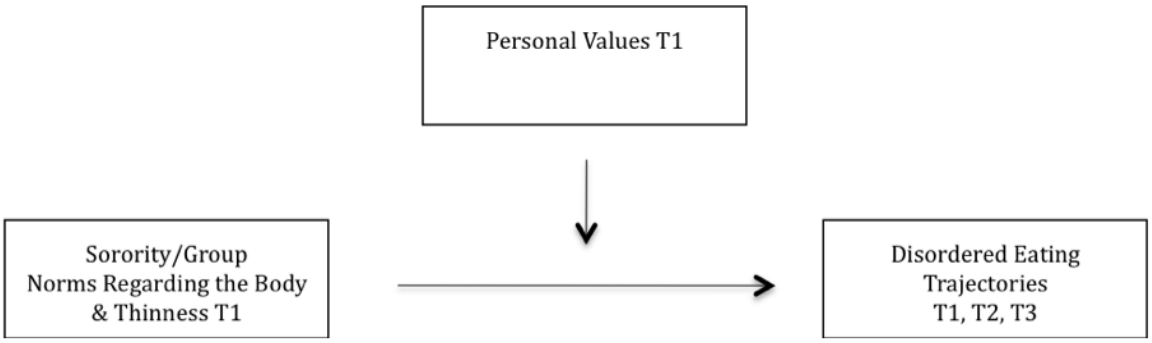

Figure 2. Sorority/group norms regarding the body & thinness and personal values predicting disordered eating trajectories.

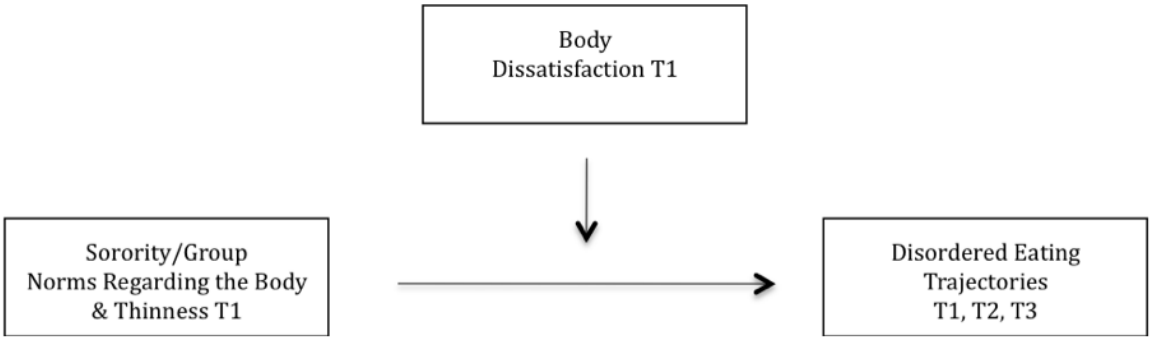

Figure 3. Sorority/group norms regarding the body & thinness and body dissatisfaction predicting disordered eating trajectories.

Moderated mediation using a cross-lag panel model. Moderated mediation in a cross-lag panel model, using structural equation modeling, was used to assess the meditational hypotheses. Specifically, in two separate models, it was tested if body dissatisfaction, thin ideal internalization, and fat talk mediate the relationship between social norms and the outcome of disordered eating among sorority women. It also was tested if this meditational model was moderated by level of identification to one's sorority. This model was assessed via a longitudinal data cross-lag panel mediation model (Cole & Maxwell, 2003).

The cross-lag panel model is a structural equation modeling technique that consists of at least two variables measured at two or more time-points in the same set of subjects. This type of model uses the inherent time ordered nature of panel data to address questions of causal ordering (Campbell & Kenny, 1999; Finkel, 1995). Cross-lag panel models are useful because they provide an opportunity to examine the pattern of covariation between variables over time, allow for the examination of directions of potential causality between variables, and establish an estimate of the relative stability of construct stability over time (Menard, 1991).

First, model fit was established using absolute and relative goodness of fit indices (Hu & Bentler, 1999). To assess absolute fit, the root means square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) were utilized. Hu and Bentler (1999) suggest that absolute fit indices less than or equal to 0.08 are considered an acceptable fit. To assess relative fit, the comparative fit index (CFI) and the non-normed fit index (NNFI) were used. Relative fit indices greater than 0.90 are considered acceptable (Marsh, Balla, & McDonald, 1988). Once the measurement model

was established, the significant pathways and direct and indirect effects were examined to test for mediation.

The structural model was examined and path coefficients were inspected for significant paths among the variables. The direct, indirect, and total effects were examined. In these models, each variable was allowed to predict its own occurrence at subsequent time points. For example, disordered eating at time 1 predicted disordered eating at time 2, which in turn predicted disordered eating at time 3. The time lag between time points is approximately equivalent, so the relationship was constrained to be equal. Other predictors were examined while the effect of the previous time point were controlled for, thus assessing how each variable influenced the change in other variables. As suggested by MacKinnon (2008), the disturbance terms on each of the variables were allowed to correlate. Figures 4 and 5 depict the proposed models. In Model 1, thin ideal internalization mediated the relationship between social norms and disordered eating, and this relationship was moderated by level of identification. In Model 2, fat talk mediated the relationship between social norms and disordered eating. This relationship was moderated by level of thin ideal internalization.

Sample size is worthy of consideration when using structural equation modeling. Floyd and Widaman (1995) suggest that five to ten participants are included per estimated parameter. In the current study, each cross lag panel model required a sample size of at least 245, using the criteria of five participants per estimated parameter.

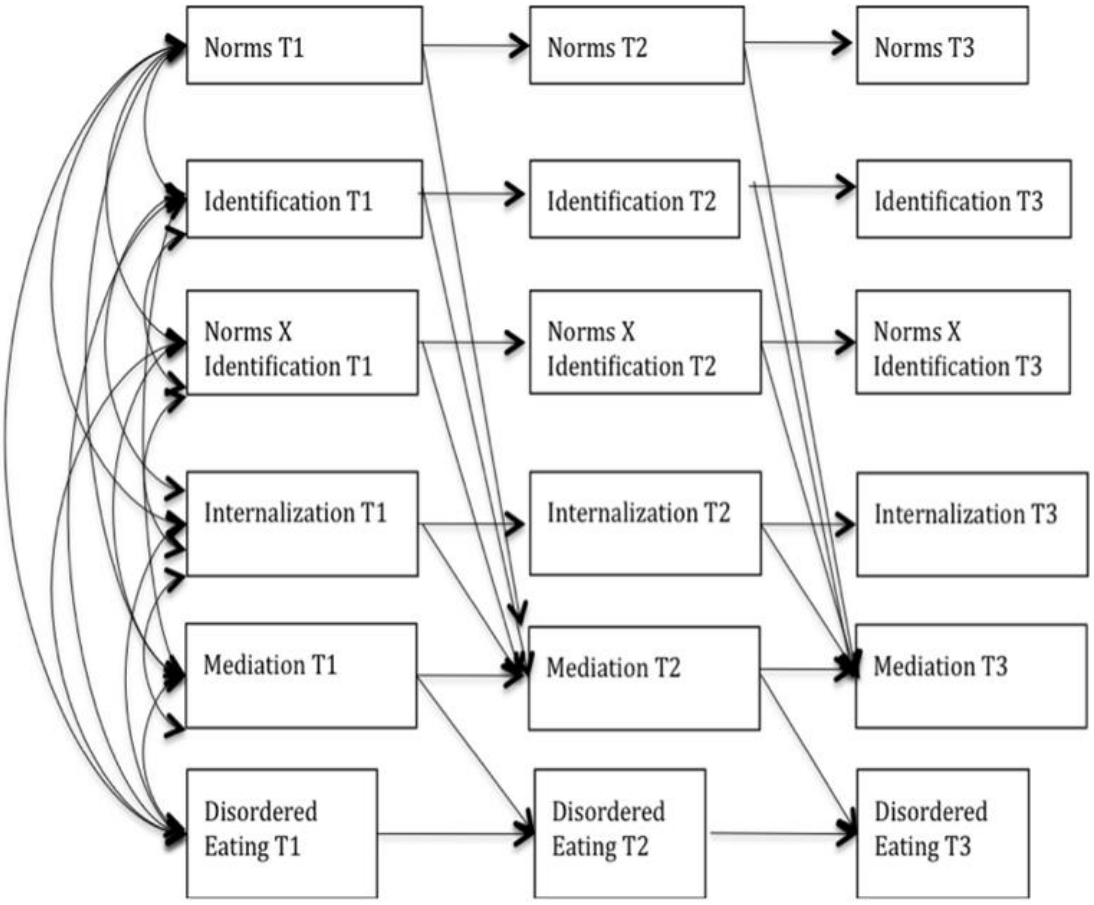

Figure 4. Mediation 1: The mediation analyses included in this cross-lag panel model examine thin ideal internalization mediating the relationship between social norms and disordered eating.

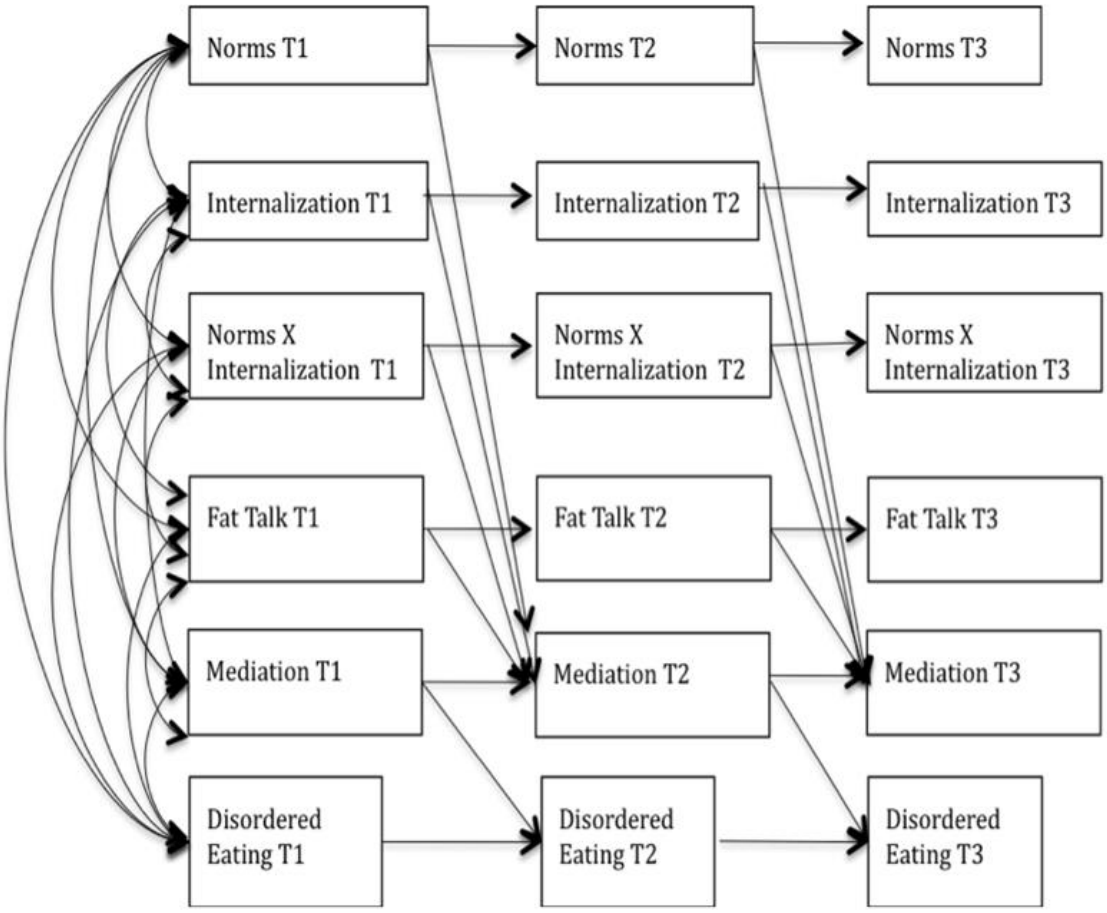

Figure 5. Mediation 2: The mediation analyses included in this cross-lag panel model examine fat talk mediating the relationship between thin ideal internalization and disordered eating.

CHAPTER FOUR

RESULTS

Descriptive Statistics

Descriptive statistics and the correlation matrix for all continuous measures for sorority women are located in Tables 1 and 2, respectively. The same descriptive statistics and correlation matrix for all continuous measures for non-sorority women are located in Tables 3 and 4, respectively.

Scores for the body and eating measures used in this study were generally in the average or mildly elevated ranged for college women. The mean scores for disordered eating ranged from .27 to .30 for sorority women and .31 to .35 for non-sorority women across the three time points. Prior research suggests that these scores represent an average level of disordered eating in the college population (Garner et al., 1983). The means scores for body dissatisfaction were .73 to .82 for sorority women and .92 to .96 for non-sorority women, which again represent an average level of body dissatisfaction in this population (Rucker & Cash, 1992). Mean scores for fat talk were also in the average range, with the mean scores ranging from 3.19 to 3.42 for sorority women and 3.04 to 3.25 for non-sorority women (Engeln-Maddox, Salk, & Miller, 2012). Scores on a measure of thin ideal internalization were mildly elevated and ranged from 26.78 to 27.35 for sorority women and 27.31 to 27.79 for non-sorority women (Fitzsimmons-Craft et al., 2012). The measures of positive and negative affect showed a similar pattern in that they

fell within the average range for college students, as demonstrated by other studies using the measure in a similar population (Wardell, Read, & Colder, 2013).

Correlations among the body and eating variables appeared aligned with the current literature, in that there were overall positive correlations among the body dissatisfaction, disordered eating, and fat talk variables for both sorority and non-sorority women. The exception was thin ideal internalization at time 3, which did not generally correlate with the disordered eating or body dissatisfaction variables, although it did positively correlate with the fat talk variable. Of note, neither sorority nor primary social group norms regarding the body and thinness tended to be consistently correlated with either body dissatisfaction or disordered eating. However, personal values for the body and thinness for both sorority and non-sorority women generally tended to be positively correlated with body dissatisfaction and disordered eating. Fat talk also tended to be positively correlated with body dissatisfaction and disordered eating for both groups at the majority of the time points.

Table 1. Descriptive Statistics for Each Measure at Each Timepoint for Sorority Women

	Time 1 (*N* = 209)			Time 2 (*N* = 203)			Time 3 (*N* = 199)		
Measure	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*
Disordered Eating	.88	.30	.31	.88	.27	.28	.91	.27	.30
Body Dissatisfaction	.86	.82	.62	.87	.74	.58	.87	.73	.58
Thin Ideal Internalization	.78	27.33	4.08	.81	27.35	4.07	.80	26.78	4.47
Personal Thinness Values	.56	4.59	1.26	.79	4.20	1.11	.82	4.08	1.15
Sorority Thinness Norms	.82	3.65	1.10	.87	3.39	1.21	.85	3.34	1.17
Fat Talk	.94	3.42	1.32	.95	3.28	1.36	.95	3.19	1.37
Positive Affect	.73	36.45	6.70	.91	35.89	7.78	.93	34.39	8.56
Negative Affect	.86	20.61	6.23	.90	20.76	7.48	.88	21.14	7.18
Sorority Identification	---	5.93	1.14	---	5.81	1.23	---	5.50	1.33
BMI	---	22.31	2.97	---	22.30	2.97	---	22.53	3.30

Table 2. Inter-Item Correlations for Each Measure at Each Timepoint for Sorority Women

	Measure	1	2	3	4	5
1	Disordered Eating T1	1.000				
2	Disordered Eating T2	.756**	1.000			
3	Disordered Eating T3	.736**	.760**	1.000		
4	Body Dissatisfaction T1	.438**	.372**	.361**	1.000	
5	Body Dissatisfaction T2	.397**	.463**	.400**	.758**	1.000
6	Body Dissatisfaction T3	.400**	.477**	.457**	.669**	.792**
7	Thin Ideal T1	.170**	.184**	.074	.221**	.250**
8	Thin Ideal T2	.204**	.219**	.233*	.174**	.174**
9	Thin Ideal T3	.115	.122	.182	-.004	-.042
10	Personal Values T1	.417**	.354**	.386**	.319**	.222**
11	Personal Values T2	.455**	.501**	.266*	.277**	.319**
12	Personal Values T3	.356**	.431**	.388**	.182	.184
13	Sorority Norms T1	.071	.205**	.108	.093	.066
14	Sorority Norms T2	.132*	.295**	.246*	.105	.133*
15	Sorority Norms T3	.242*	.286**	.229*	.076	.023
16	Fat Talk T1	.452**	.355**	.427**	.519**	.429**
17	Fat Talk T2	.430**	.451**	.283**	.470**	.509**

	Measure	1	2	3	4	5
18	Fat Talk T3	.304**	.394**	.411**	.241*	.259*
16	Fat Talk T1	.452**	.355**	.427**	.519**	.429**
17	Fat Talk T2	.430**	.451**	.283**	.470**	.509**
18	Fat Talk T3	.304**	.394**	.411**	.241*	.259*
19	Positive Affect T1	-.121*	-.112	-.258*	-.281**	-.275**
20	Positive Affect T2	-.069	-.061	-.253*	-.246**	-.263**
21	Positive Affect T3	-.319**	-.325**	-.353**	-.330**	-.398**
22	Negative Affect T1	.238**	.258**	.240*	.294**	.290**
23	Negative Affect T2	.244**	.304**	.390**	.278**	.311**
24	Negative Affect T3	.224*	.284**	.288**	.213*	.231*
25	Sorority Ident. T1	.017	-.015	.161	.034	-.047
26	Sorority Ident. T2	.053	-.008	.045	-.072	-.110
27	Sorority Ident. T3	-.111	-.012	.029	.164	-.023
28	BMI T1	.130*	.108	.213*	.393**	.381**
29	BMI T2	.105	.093	.182	.424**	.409**
30	BMI T3	.093	.181	.209*	.518**	.531**

	Measure	6	7	8	9	10
6	Body Dissatisfaction T3	1.000				
7	Thin Ideal T1	.200	1.000			
8	Thin Ideal T2	.183	.485**	1.000		
9	Thin Ideal T3	.078	.415**	.519**	1.000	
10	Personal Values T1	.231*	.162**	.268**	.147	1.000
11	Personal Values T2	.185	.336**	.367**	.223*	.491**
12	Personal Values T3	.261*	.234*	.478**	.289**	.646**
13	Sorority Norms T1	.085	.086	.110	-.008	.346**
14	Sorority Norms T2	.110	.122	.106	.080	.170*
15	Sorority Norms T3	.083	.188	.212*	.115	.287**
16	Fat Talk T1	.374**	.252**	.335**	.182	.337**
17	Fat Talk T2	.350**	.298**	.391**	.316**	.403**
18	Fat Talk T3	.355**	.356**	.487**	.400**	.397**
19	Positive Affect T1	-.231*	-.110*	.002	-.041	-.018
20	Positive Affect T2	-.262*	-.035	-.027	-.068	.049
21	Positive Affect T3	-.292**	.093	-.074	.047	-.018
22	Negative Affect T1	.226*	.125*	.113	.137	.065
23	Negative Affect T2	.309**	.124	.127	.186	.178**
24	Negative Affect T3	.238*	.252*	.183	.299**	.215

	Measure	6	7	8	9	10
25	Sorority Ident. T1	.059	-.078	.033	-.188	.139**
26	Sorority Ident. T2	-.059	-.094	.065	-.043	.127
27	Sorority Ident. T3	.003	-.032	-.013	-.003	.178
28	BMI T1	.410**	-.053	-.104	-.160	.085
29	BMI T2	.450**	.031	-.070	-.049	.087
30	BMI T3	.548**	-.148	-.182	-.187	.003

	Measure	11	12	13	14	15
11	Personal Values T2	1.000				
12	Personal Values T3	.678**	1.000			
13	Sorority Norms T1	.221**	.318**	1.000		
14	Sorority Norms T2	.424**	.365**	.573**	1.000	
15	Sorority Norms T3	.398**	.559**	.551**	.735**	1.000
16	Fat Talk T1	.388**	.321**	.087	.087	.070
17	Fat Talk T2	.528**	.519**	.143*	.204**	.300**
18	Fat Talk T3	.422**	.557**	.182	.210	.231*
19	Positive Affect T1	.032	.066	.121*	.073	.088
20	Positive Affect T2	.090	-.061	.064	-.014	-.017
21	Positive Affect T3	-.121	-.104	-.054	-.124	-.049
22	Negative Affect T1	.097	.063	.002	.108	.235*

	Measure	11	12	13	14	15
23	Negative Affect T2	.207**	.277**	.139*	.169*	.458**
24	Negative Affect T3	.247*	.417**	.231*	.248*	.398**
25	Sorority Ident. T1	.042	.070	.045	.024	.101
26	Sorority Ident. T2	.098	.143	.024	-.007	.013
27	Sorority Ident. T3	.043	.081	-.097	-.152	-.169
28	BMI T1	.039	-.064	.002	.068	-.077
29	BMI T2	.066	-.028	-.006	.044	-.196
30	BMI T3	-.158	-.049	-.075	-.017	-.081

	Measure	16	17	18	19	20
16	Fat Talk T1	1.000				
17	Fat Talk T2	.723**	1.000			
18	Fat Talk T3	.687**	.808**	1.000		
19	Positive Affect T1	-.162**	.037	-.008	1.000	
20	Positive Affect T2	.022	.028	-.094	.536**	1.000
21	Positive Affect T3	-.146	-.096	-.138	.597**	.703**
22	Negative Affect T1	.209**	.195**	.272*	-.197**	-.114
23	Negative Affect T2	.255**	.299**	.311**	-.095	-.045
24	Negative Affect T3	.253*	.349**	.429**	-.169	-.062
25	Sorority Ident. T1	.093	.065	.125	.091	.070

	Measure	16	17	18	19	20
26	Sorority Ident. T2	.126	.111	.251*	.088	.163*
27	Sorority Ident. T3	.230*	.150	.135	-.004	.060
28	BMI T1	.153**	.102	-.118	-.036	-.188**
29	BMI T2	.119	.104	-.076	-.157*	-.175**
30	BMI T3	.068	-.025	-.061	-.225*	-.304**

	Measure	21	22	23	24	25
21	Positive Affect T3	1.000				
22	Negative Affect T1	-.130	1.000			
23	Negative Affect T2	-.183	.652**	1.000		
24	Negative Affect T3	-.148	.592**	.518**	1.000	
25	Sorority Ident. T1	.052	-.041	-.085	.032	1.000
26	Sorority Ident. T2	.113	-.037	-.087	.187	.622**
27	Sorority Ident. T3	.054	-.017	-.167	.103	.405**
28	BMI T1	-.227*	.081	.102	-.014	.103*
29	BMI T2	-.266*	.050	.060	-.077	-.013
30	BMI T3	-.278**	.105	.178	-.002	.153

	Measure	26	27	28	29	30
26	Sorority Ident. T2	1.000				
27	Sorority Ident. T3	.553**	1.000			
28	BMI T1	-.049	-.009	1.000		
29	BMI T2	-.140*	-.044	.781**	1.000	
30	BMI T3	-.124	.090	.892**	.844**	1.000

Table 3. Descriptive Statistics for Each Measure at Each Timepoint for Non-Sorority Women

	Time 1 (*N* = 255)			Time 2 (*N* = 142)			Time 3 (*N* = 105)		
Measure	α	*M*	*SD*	α	*M*	*SD*	α	*M*	*SD*
Disordered Eating	.92	.35	.37	.92	.31	.34	.93	.32	.37
Body Dissatisfaction	.89	.92	.72	.88	.92	.67	.90	.96	.73
Thin Ideal Intern.	.81	27.79	4.52	.79	27.31	4.34	.78	27.50	4.12
Personal Thinness	.78	4.47	1.27	.81	4.18	1.28	.78	4.16	1.19
Values									
Primary Social Group	.85	3.98	1.32	.86	3.67	1.29	.87	3.75	1.30
Thinness Norms									
Fat Talk	.95	3.25	1.46	.96	3.04	1.41	.97	3.14	1.51
Positive Affect	.86	35.47	6.66	.91	34.65	7.62	.88	33.90	7.16
Negative Affect	.87	22.37	7.59	.89	21.51	7.47	.89	22.35	7.67
Primary Social Group	---	5.53	1.21	---	5.48	1.24	---	5.48	1.17
Identification									
BMI	---	23.03	4.21	---	23.01	3.98	---	23.15	4.01

Table 4. Inter-Item Correlations for Each Measure at Each Timepoint for Non-Sorority Women

	Measure	1	2	3	4	5
1	Disordered Eating T1	1.000				
2	Disordered Eating T2	.232**	1.000			
3	Disordered Eating T3	.061	.556**	1.000		
4	Body Dissatisfaction T1	.527**	.314**	.263*	1.000	
5	Body Dissatisfaction T2	.152	.540**	.399**	.363**	1.000
6	Body Dissatisfaction T3	.152	.527**	.498**	.407**	.899**
7	Thin Ideal T1	.304**	.181*	.108	.423**	.273**
8	Thin Ideal T2	.203*	.219**	.231*	.001	.253**
9	Thin Ideal T3	-.043	.045	.210	.094	.221*
10	Personal Values T1	.298**	.471**	.437**	.284**	.331**
11	Personal Values T2	.105	.608**	.365**	.159*	.491**
12	Personal Values T3	.080	.513**	.601**	.290*	.457**
13	Primary Social Group Norms T1	.152**	.169*	.163	.158**	.121
14	Primary Social Group Norms T2	.026	.248**	.109	.066	.198**
15	Primary Social Group Norms T3	.162	.175	.153	.220	.251*
16	Fat Talk T1	.395**	.355**	.356**	.504**	.217**
17	Fat Talk T2	.078	.452**	.440**	.157	.519**

	Measure	1	2	3	4	5
18	Fat Talk T3	.117	.485**	.565**	.246*	.593**
19	Positive Affect T1	-.217**	-.069	-.065	-.231**	-.102
20	Positive Affect T2	.013	.003	.051	-.011	-.073
21	Positive Affect T3	-.151	-.155	-.148	-.063	-.183
22	Negative Affect T1	.370**	.035	.057	.323**	.087
23	Negative Affect T2	-.088	-.089	-.096	-.141	-.088
24	Negative Affect T3	.212	.330**	.405**	.165	.273*
25	Primary Social Group Ident. T1	.088	-.079	.027	.064	-.071
26	Primary Social Group Ident. T2	.006	-.114	-.034	-.020	-.112
27	Primary Social Group Ident. T3	.070	-.190	-.065	-.122	-.165
28	BMI T1	.131*	.366**	.320**	.328**	.552**
29	BMI T2	.045	.276**	.225*	.270**	.526**
30	BMI T3	.089	.316**	.232*	.207	.639**

	Measure	6	7	8	9	10
6	Body Dissatisfaction T3	1.000				
7	Thin Ideal T1	.267*	1.000			
8	Thin Ideal T2	.265*	.275**	1.000		
9	Thin Ideal T3	.256*	.350**	.605**	1.000	
10	Personal Values T1	.404**	.304**	.242**	.260*	1.000
11	Personal Values T2	.467**	.116	.294**	.171	.751**
12	Personal Values T3	.450**	.151	.381**	.356**	.760**
13	Primary Social Group Norms T1	.144	.179**	.086	.192	.491**
14	Primary Social Group Norms T2	.281**	.054	.186*	.154	.469**
15	Primary Social Group Norms T3	.248*	.075	.327**	.213*	.522**
16	Fat Talk T1	.312**	.427**	.135	.103	.318**
17	Fat Talk T2	.595**	.151	.271**	.378**	.433**
18	Fat Talk T3	.617**	.244*	.430**	.407**	.422**
19	Positive Affect T1	-.189	-.175**	.011	-.274*	-.058
20	Positive Affect T2	-.017	-.232**	-.187*	-.038	-.009
21	Positive Affect T3	-.162	.015	-.180	-.105	-.120
22	Negative Affect T1	.101	.137*	-.036	-.102	.046
23	Negative Affect T2	-.165	-.089	.033	.128	-.094
24	Negative Affect T3	.297**	.112	.107	.153	.306**

	Measure	6	7	8	9	10
25	Primary Social Group Ident. T1	-.015	.008	.000	.000	-.065
26	Primary Social Group Ident. T2	-.110	-.021	-.066	-.196	-.029
27	Primary Social Group Ident. T3	-.067	-.024	-.005	-.122	-.105
28	BMI T1	.683**	.093	-.093	.131	.107
29	BMI T2	.642**	.107	-.045	.060	.148
30	BMI T3	.645**	.101	.156	.084	.266*

	Measure	11	12	13	14	15
11	Personal Values T2	1.000				
12	Personal Values T3	.704**	1.000			
13	Primary Social Group Norms T1	.331**	.400**	1.000		
14	Primary Social Group Norms T2	.567**	.384**	.572**	1.000	
15	Primary Social Group Norms T3	.479**	.528**	.680**	.750**	1.000
16	Fat Talk T1	.171*	.259*	.174**	.086	.095
17	Fat Talk T2	.495**	.549**	.229**	.329**	.382**
18	Fat Talk T3	.485**	.553**	.297**	.297**	.369**
19	Positive Affect T1	-.097	-.192	-.036	-.151	-.253*
20	Positive Affect T2	-.034	.036	.008	-.011	-.021
21	Positive Affect T3	-.085	-.169	.006	-.142	-.129
22	Negative Affect T1	-.033	.048	-.063	-.012	-.006

	Measure	11	12	13	14	15
23	Negative Affect T2	-.064	-.119	-.035	-.053	-.006
24	Negative Affect T3	.227*	.419**	.084	.066	.142
25	Primary Social Group Ident. T1	-.070	-.093	-.025	.041	.032
26	Primary Social Group Ident. T2	-.063	-.120	-.017	-.057	-.005
27	Primary Social Group Ident. T3	-.185	-.194	.023	-.079	-.074
28	BMI T1	.259**	.346**	.046	.049	.116
29	BMI T2	.236**	.287**	.073	.052	.123
30	BMI T3	.351**	.254*	.090	.185	.145

	Measure	16	17	18	19	20
16	Fat Talk T1	1.000				
17	Fat Talk T2	.386**	1.000			
18	Fat Talk T3	.428**	.841**	1.000		
19	Positive Affect T1	-.203**	-.127	-.136	1.000	
20	Positive Affect T2	.081	.089	.006	-.073	1.000
21	Positive Affect T3	-.271*	-.308**	-.253*	.081	-.013
22	Negative Affect T1	.372**	-.064	-.053	-.220**	.130
23	Negative Affect T2	-.071	-.012	-.076	.069	-.121
24	Negative Affect T3	.200	.401**	.425**	-.049	.156
25	Primary Social Group Ident. T1	.023	.071	.052	.089	.073

	Measure	16	17	18	19	20
26	Primary Social Group Ident. T2	-.024	-.073	-.142	.065	-.061
27	Primary Social Group Ident. T3	-.033	-.112	-.065	-.031	.167
28	BMI T1	.188**	.292**	.455**	-.089	.025
29	BMI T2	.052	.275**	.425**	-.062	-.006
30	BMI T3	.068	.417**	.447**	-.032	.033

	Measure	21	22	23	24	25
21	Positive Affect T3	1.000				
22	Negative Affect T1	-.122	1.000			
23	Negative Affect T2	-.080	-.070	1.000		
24	Negative Affect T3	-.306**	.287*	.013	1.000	
25	Primary Social Group Ident. T1	.335**	.044	-.052	.009	1.000
26	Primary Social Group Ident. T2	.218*	.014	-.006	-.074	.369**
27	Primary Social Group Ident. T3	.284**	-.089	-.024	-.178	.356**
28	BMI T1	-.063	.060	-.114	.214	-.061
29	BMI T2	.036	.112	-.091	.217*	.073
30	BMI T3	-.118	.140	-.110	.211	-.053

	Measure	26	27	28	29	30
26	Primary Social Group Ident. T2	1.000				
27	Primary Social Group Ident. T3	.628**	1.000			
28	BMI T1	.074	-.080	1.000		
29	BMI T2	.059	-.080	.908**	1.000	
30	BMI T3	-.020	-.003	.900**	.934**	1.000

Research Questions: Factor Structures of the Sorority/Group Social Norms and Personal Values Regarding the Body and Thinness Questionnaires

Sorority social norms. Exploratory factor analysis was used to discern the underlying factor structure of the sorority social norms questionnaire. All sorority women who participated in the first timepoint of this study were included in this analysis (N = 244). Principal axis factoring with direct oblimin rotation was used to examine this factor structure, according to recommendations on use of factor analysis for scale creation (e.g., Gorsuch, 1997; Preacher & MacCallum, 2003). According to Gorsuch (1983), a minimum of five participants per measured variable is recommended for exploratory factor analysis, which places the current sample in the acceptable range. An examination of Kaiser-Meyer-Olkin's (KMO; Kaiser, 1970, 1974) measure of sampling adequacy (MSA) indicated that these items had a high degree of common variance, KMO = .74.

Parallel analysis was used to identify how many factors to retain. Parallel analysis is generally recommended for specifying how many factors to retain when conducting exploratory factor analyses (Kahn, 2006; Zwick & Velicer, 1986). This analysis generates random sets of data with dimensions matching those of the actual dataset and completes a factor analysis. Factors from the actual dataset with eigenvalues larger than those from the randomly generated datasets (that is, where plots of eigenvalues for the randomly generated and actual data sets cross at a 95% CI) are retained. The present study utilized Watkins' (2006) MonteCarlo program, and a one-factor structure was suggested. An examination of the pattern matrix indicated that all items loaded cleanly on one factor. All item loadings were above .50 (range: 0.53 to 0.84). The eigenvalue prior to rotation was 2.94. The cumulative common variance accounted for was 50%. Table 5 includes the

pattern matrix coefficients from the exploratory factor analysis with the five items included in the scale. Cronbach's alpha for this scale was 0.82, which demonstrates good internal consistency.

Table 5. Pattern Matrix Coefficients for Exploratory Factor Analysis (EFA) for Sorority Social Norms (N = 244) at Time 1

Item	Factor Matrix Value
How much does your sorority value…	
Thinness	.825
Physical Appearance	.842
Dieting	.735
Exercising	.527
Fitting in with a social group	.537

Group social norms. A second exploratory factor analysis was performed and used the same procedure mentioned above to examine the factor structure of the group social norms regarding the body and thinness questionnaire for non-sorority women (i.e., the control group). All control group participants who completed the first timepoint of this study were included in this analysis (N = 312). Sample size was adequate, and Kaiser-Meyer-Olkin's measure of sampling adequacy (MSA) suggested that the items had a high degree of common variance, KMO = .79.

Parallel analysis suggested a one-factor structure, which was also recommended by an examination of the pattern matrix from the exploratory factor analysis. All item

loadings were above .50 (range: .59 to .88). The eigenvalue prior to rotation was 3.11. The cumulative common variance accounted for was 54%. Table 6 includes the pattern matrix coefficients from the exploratory factor analysis with the five items included in the scale. Cronbach's alpha for this scale was 0.85, which demonstrates good internal consistency.

Table 6. Pattern Matrix Coefficients for Exploratory Factor Analysis (EFA) for Non-Sorority Group Social Norms (N = 312) at Time 1

Item	Factor Matrix Value
How much does your primary social group value…	
Thinness	.875
Physical Appearance	.760
Dieting	.789
Exercising	.587
Fitting in with a social group	.607

Personal values regarding the body and thinness. A third exploratory factor analysis was conducted and used the same procedure to determine the factor structure of the personal values regarding the body and thinness questionnaire for both sorority women and non-sorority women (i.e., the control group). All participants who completed the first timepoint of this study were included (N = 554). Again, sample size was

sufficient and a high degree of common variance (KMO = .74) was suggested by Kaiser-Meyer-Olkin's measure of sampling adequacy (MSA).

A one-factor structure was suggested by parallel analysis, as well as an examination of the pattern matrix from the exploratory factor analysis. Item loadings ranged from .47 to .76, and the eigenvalue prior to rotation was 2.38. The cumulative common variance accounted for was 36%. Table 7 includes the pattern matrix coefficients from the exploratory factor analysis with the five items included in the scale. Cronbach's alpha for this scale was .69.

Table 7. Pattern Matrix Coefficients for Exploratory Factor Analysis (EFA) for Personal Values Regarding the Body and Thinness (N = 554) at Time 1

Item	Factor Matrix Value
How much do you personally value…	
Thinness	.500
Physical Appearance	.761
Dieting	.684
Exercising	.468
Fitting in with a social group	.517

Sorority Versus Non-Sorority Women: Disordered Eating Trajectories

Hierarchical linear modeling (HLM) was used to investigate the following hypotheses via the HLM6 program (HLM6; Raudenbush, Bryk, Sheong, & Congdon, 2000). This study's first hypothesis examined sorority women versus non-sorority

women and their initial levels of disordered eating, disordered eating trajectories over time, and predictors of these outcomes (Table 8). First, it was predicted that sorority women would exhibit higher baseline levels of disordered eating than non-sorority women (hypothesis 1.1). An examination of the intercept terms in Table 8 revealed that this hypothesis was not supported since the intercept term for group membership was not significant. Examining the predictors of slope terms in Table 8 also suggested that sorority membership was not significantly associated with disordered eating trajectories in disordered eating over time (hypothesis 1.2). Partial support was found for hypothesis 1.3, which examined predictors of disordered eating trajectories. An examination of slope coefficients revealed that fat talk ($\beta = .03$, $t(1178) = 2.92$, $p = .004$) and personal thinness values ($\beta = .05$, $t(178) = 2.93$, $p = .004$) significantly predicted increasing disordered eating over time. Sorority/group norms regarding body and thinness, thin ideal internalization, body dissatisfaction, body mass index, negative affect, and positive affect did not significantly predict increasing disordered eating over time. Also of note, disordered eating scores did not significantly differ over time.

Hypothesis 2 investigated interactions between individual predictors (Table 8). The sorority and group social norms questionnaires regarding the body and thinness revealed similar factor structures and were combined into one social group norm variable. Hypothesis 2 was partially supported. Personal values did not moderate the relationship between sorority/group norms and disordered eating. Body dissatisfaction did not moderate the relationship between sorority/group norms and disordered eating. The interaction of personal values by body dissatisfaction predicted increasing levels of

disordered eating over time (β = .01, t(178) = 2.67, *p* = .01). In other words, body dissatisfaction moderated the relationship between personal values and disordered eating.

As depicted in Figure 6, simple slope analyses revealed that for participants with high levels of body dissatisfaction, higher levels of personal values regarding the body and thinness significantly predicted disordered eating trajectories (β = .04, t(178) = 5.88, *p* < .001). However, this relationship was not significant for women with lower levels of body dissatisfaction. In other words, for women with lower levels of body dissatisfaction, personal values regarding the body and thinness did not significantly predict eating disorder trajectories (β = .01, t(178) = 1.44, *p* = .15).

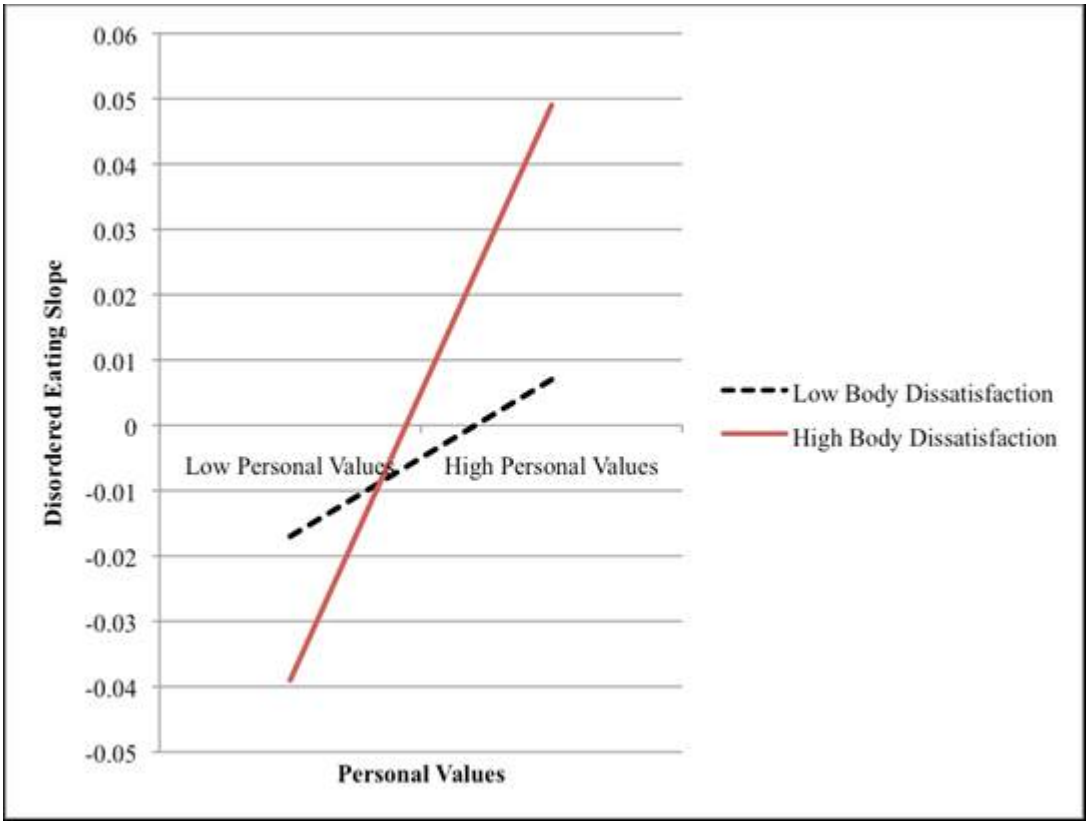

Figure 6. Simple slope analyses: Body dissatisfaction x personal values interaction predicting disordered eating slope.

Table 8. Predictors of Disordered Eating Trajectories

	Coefficient	SE	t Ratio(169)	*p*
Intercept Terms				
Intercept, B00	.28	.03	11.34	<.001
Sorority Membership, B01	.03	.03	.81	.42
Disordered Eating T1, B02	1.36	.06	23.23	<.001
Fat Talk, B03	-.01	.01	-1.34	.18
Thin Ideal Internalization, B04	.002	.01	.38	.70
Positive Affect, B05	.003	.002	1.38	.17
Negative Affect, B06	-.0005	.002	-.26	.79
Body Mass Index, B07	-.0005	.007	-.08	.94
Body Dissatisfaction, B08	-.02	.03	-.62	.54
Personal Thinness Values, B09	-.04	.02	-1.72	.09
Sorority/Group Body & Thinness Norms, B010	.002	.01	.24	.81
Slope Terms				
Intercept B10	.005	.02	.26	.79
Sorority Membership, B11	-.03	.02	-1.42	.16
Disordered Eating T1, B12	-.42	.05	-8.90	<.001
Fat Talk, B13	.03	.01	2.93	.004
Thin Ideal Internalization, B14	-.001	.004	-.20	.84
Positive Affect, B15	-.002	.002	-.85	.40
Negative Affect, B16	-.001	.002	-.38	.71
Body Mass Index, B17	.01	.01	1.30	.20
Body Dissatisfaction, B18	-.001	.02	-.10	.93
Personal Thinness Values, B19	.05	.02	2.93	.004
Sorority/Group Body & Thinness Norms, B110	-.01	.01	-.73	.47
Personal Thinness Values X Sorority/Group Body & Thinness Norms Interaction, B111	.004	.004	1.28	.20
Sorority/Group Body & Thinness X Body Dissatisfaction Interaction, B112	.001	.005	.17	.87
Personal Thinness Values X Body Dissatisfaction Interaction, B113	.01	.004	2.67	.01

Social-Cognitive Mechanisms & Sorority Women: Structural Equation Modeling Findings

Structural equation modeling was utilized to investigate the relationships among sorority social norms, thin ideal internalization, fat talk, sorority identification, and disordered eating. Body mass index (BMI) was controlled for in each model. All analyses were completed via MPLUS Version 6.12 (Muthén, & Muthén, 2007). Tables 9, 10, 11, and 12 depict the results of these analyses. Two cross-lag panel models were used in the present study to examine the following two hypotheses (labeled *Hypothesis 3 and 4* in the Introduction section):

1) Model 1: Over time, the relationship between social norms of sorority women and disordered eating is expected to be mediated by level of thin ideal internalization. This mediation relationship of social norms, thin ideal internalization, and disordered eating is expected to vary by level of identification to one's sorority.

2) Model 2: Over time, the relationship between social norms of sorority women and disordered eating is expected to be mediated by fat talk. This mediation relationship of social norms, fat talk, and disordered eating is expected to vary by level of thin ideal internalization.

Model 1: Social norms, thin ideal internalization, & disordered eating. The first moderated mediation cross-lag panel model examined whether the mediation model containing social norms, thin ideal internalization, and disordered eating was moderated by level of identification to one's sorority. This model displayed poor model fit (See Table 9 for goodness of fit statistics and Table 10 for coefficients). The root means square error of approximation (RMSEA) and the standardized root mean square residual

(SRMR) were used to assess absolute fit. Both of these values were in the unacceptable range (Table 9). The comparative fit index (CFI) and the non-normed fit index (NNFI) were used to assess relative fit. While the CFI value was in the acceptable range, the NNFI value was below the acceptable cutoff (Table 9).

Next, the path coefficients were inspected for significant paths among the variables (Table 10). For social norms, disordered eating, and sorority identification, all variables significantly predicted their own occurrence at subsequent time points (i.e., Time 1 predicted Time 2, Time 2 predicted Time 3). For the thin ideal internalization variable, Time 1 significantly predicted Time 2, but Time 2 only marginally predicted Time 3. Social norms did not significantly predict thin ideal internalization at subsequent time points. Thin ideal internalization did not significantly predict disordered eating at subsequent time points. The other significant coefficient was the coefficient for the interaction of sorority norms and the identification at time 2 predicting the interaction at time 3. However, this interaction was not probed due to the model having poor overall fit. No other path coefficients in this model were statistically significant. Thus, neither mediation nor moderation at all three timepoints were illustrated in this model.

Table 9. Goodness of Fit Indices for Model 1

	Measures of Fit			
	RMSEA	SRMR	NNFI	CFI
Model 1	.23	.15	.37	.61

Table 10. Coefficients for Model 1

	Coefficients			
Model 1	Est.	S.E.	Est./S.E.	*p*
Disordered Eating 1→ Disordered Eating 2	.85	.04	21.02	<.001
Disordered Eating 2→ Disordered Eating 3	.79	.07	12.09	<.001
Norms 1→ Norms 2	.58	.07	8.67	<.001
Norms 2→ Norms 3	.72	.06	12.42	<.001
Thin Ideal 1→ Thin Ideal 2	.45	.08	5.95	<.001
Thin Ideal 2→ Thin Ideal 3	.42	.24	1.79	.07
Identification 1→ Identification 2	.88	.04	22.18	<.001
Identification 2→ Identification 3	.83	.05	15.43	<.001
Norms 1→ Thin Ideal 2	.45	.59	.77	.44
Norms 2→ Thin Ideal 3	.48	.56	.85	.40
Thin Ideal 1→ Disordered Eating 2	.003	.05	.06	.95
Thin Ideal 2 → Disordered Eating 3	.02	.07	.34	.74
Interaction 1→ Interaction 2	.34	.59	.58	.57
Interaction 2→ Interaction 3	.81	.09	9.29	<.001

Model 2: Social norms, fat talk, & disordered eating. The second moderated mediation cross-lag panel model examined whether the mediation model containing social norms, fat talk, and disordered eating was moderated by level of thin ideal internalization. This model also displayed poor model fit (see Table 11). Both absolute fit indices (RMSEA and SRMR) and both relative fit indices (CFI and NNFI) were in the unacceptable ranges.

As in model 1, the path coefficients were examined for significant paths among the variables (Table 12). For social norms, fat talk, disordered eating, and thin ideal internalization, all variables significantly predicted their own occurrence at subsequent time points (i.e., Time 1 predicted Time 2, Time 2 predicted Time 3). Social norms did not significantly predict fat talk at subsequent time points. Fat talk did not significantly predict disordered eating at subsequent time points. The other significant coefficient was the coefficient for the interaction of sorority norms and the thin ideal internalization at time 2 predicting the interaction at time 3. However, this interaction was not probed due to the model having poor overall fit. Thus, neither mediation nor moderation at all three timepoints were illustrated in this model.

Table 11. Goodness of Fit Indices for Model 2

	Measures of Fit			
	RMSEA	SRMR	NNFI	CFI
Model 2	.22	.13	.38	.61

Table 12. Coefficients for Model 2

	Coefficients			
Model 2	Est.	S.E.	Est./S.E.	*p*
Disordered Eating 1→ Disordered Eating 2	.86	.04	19.98	<.001
Disordered Eating 2→ Disordered Eating 3	.78	.07	11.13	<.001
Norms 1→ Norms 2	.58	.07	8.54	<.001
Norms 2→ Norms 3	.74	.05	14.17	<.001
Thin Ideal 1→ Thin Ideal 2	.46	.08	6.20	<.001
Thin Ideal 2→ Thin Ideal 3	.52	.07	8.01	<.001
Fat Talk 1→ Fat Talk 2	.71	.06	12.76	<.001
Fat Talk 2→ Fat Talk 3	.65	.19	3.48	<.001
Norms 1→ Fat Talk 2	.57	.39	1.44	.15
Norms 2→ Fat Talk 3	-.44	.34	-1.32	.19
Fat Talk 1→ Disordered Eating 2	.01	.06	.08	.94
Fat Talk 2 → Disordered Eating 3	.18	.12	1.48	.14
Interaction 1→ Interaction 2	-.81	.51	-1.60	.11
Interaction 2→ Interaction 3	.56	.16	3.60	<.001

CHAPTER FIVE

DISCUSSION

The present quasi-experimental longitudinal study examined the development of disordered eating in sorority women versus non-sorority women over the course of an academic year. Three waves of data were collected from sorority and non-sorority women at Northwestern University and Loyola University Chicago. The sample of sorority women from Northwestern University and Loyola University Chicago consisted of five sororities who agreed to participate in this study. Sorority members from the remaining twelve sororities on these campuses that did not participate as a group were recruited through online listservs. The control group for this study, consisting of non-sorority women, was recruited from campus and class listservs.

The present research consisted of two primary goals. The first goal was to investigate eating and body pathology in sorority women, a group that has been traditionally considered at-risk for the development and exacerbation of disordered eating. Group differences regarding body and eating pathology trajectories between sorority and non-sorority women over time were evaluated through several hypotheses. The second goal of this research was to investigate social norms, group identification, thin ideal internalization, and social comparison as mechanisms through which disordered eating develops over time within the sorority group.

Preliminary Research Questions

Before the primary aims of this study could be investigated, it was necessary to conduct exploratory factor analyses to determine the underlying factor structure of the three questionnaires created for this study. A total of three exploratory factor analyses were completed in the present research.

The first two exploratory factor analyses examined the underlying factor structures of the sorority social norms questionnaire and group social norms questionnaire. These measures included questions regarding participants' perception of their sorority or primary social group's thinness, physical appearance, dieting, and fitting in with a social group. The analyses yielded a one-factor structure for both measures.

The third exploratory factor analysis determined the underlying factor structure of the personal values regarding thinness and the body questionnaire. This measure assessed participants' personal values for themselves regarding thinness, physical appearance, dieting, and fitting in with a social group. Similar to the first two analyses, this measure also conformed to a one-factor structure.

Of note, these three measures were subsequently proved to be reliable and there was evidence for validation through the analyses used in this study. The evidence for scale validation for the sorority/group social norms and personal values regarding the body and thinness measures will be discussed in a later section of this work.

Disordered Eating Trajectories Over Time for Sorority Women Versus Non-Sorority Women

Table 13 illustrates the major hypotheses of the present study. Hypotheses 1 through 3 are depicted below.

Table 13. Support for Study Hypotheses

Hypothesis	Support
1.1) Sorority membership predicts higher baseline disordered eating	No
1.2) Sorority membership predicts disordered eating trajectory	No
1.3) Disordered eating trajectory predicted by:	
Sorority/group norms regarding body and thinness, thin ideal internalization, body dissatisfaction, negative affect, and positive affect	No
Fat talk and personal values regarding the body and thinness	Yes
2.1) Personal values moderates the relationship between sorority/group norms and disordered eating.	No
2.2) Body dissatisfaction moderates the relationship between sorority/group norms and disordered eating.	No
2.3) Body dissatisfaction moderates the relationship between personal values and disordered eating.	Yes
3.1) Over time, social norms of sorority women are associated with disordered eating, such that more body-focused social norms is associated with more disordered eating.	No
3.2) Over time, thin ideal internalization is associated with disordered eating, such that higher thin ideal internalization is associated with more disordered eating.	No
3.3) The impact of social norms on disordered eating is significantly reduced after controlling for the thin ideal internalization mediator variable.	No
3.4) The mediation relationship of social norms, thin ideal internalization, and disordered eating varies by level of identification to one's sorority.	No
4.1) Over time, social norms of sorority women are associated with disordered eating, such that more body-focused social norms is associated with more disordered eating.	No
4.2) Over time, fat talk is associated with disordered eating, such that more fat talk is associated with more disordered eating.	No
4.3) The impact of social norms on disordered eating is significantly reduced after controlling for the fat talk mediator variable.	No
4.4) The mediation relationship of social norms, fat talk, and disordered eating varies by level of thin ideal internalization.	No

The first primary goal of this research was to examine eating and body pathology in sorority versus non-sorority women over time. Group differences were examined through the following hypotheses: *Hypothesis 1.1* predicted that sorority women will exhibit higher baseline levels of disordered eating than non-sorority women, *Hypothesis 1.2* predicted that sorority membership will predict trajectories in disordered eating over time, and *Hypothesis 1.3* predicted that personal values regarding the body and thinness, sorority/group norms regarding body and thinness, thin ideal internalization, body dissatisfaction, fat talk, negative affect, and positive affect will predict trajectories of disordered eating across the three time points. Hypotheses 1.1 and 1.2 were not supported, whereas partial support was found for hypothesis 1.3. Disordered eating at time 1 also significantly predicted increasing disordered eating over time. Fat talk and personal thinness values significantly predicted increasing disordered eating over time. Sorority/group norms regarding body and thinness, thin ideal internalization, body dissatisfaction, negative affect, and positive affect did not significantly predict increasing disordered eating over time.

The findings from hypothesis 1 may offer new insights in the eating disorder literature regarding fat talk and personal thinness values. This is the first study to illustrate the predictive value of fat talk on disordered eating trajectories. In the present research, time 1 fat talk was associated with increased levels of disordered eating from the beginning to the end of the academic year. Fat talk is one type of proximal social comparison, in the context of the greater distal social comparison that is characterized by women's tendency to internalize the cultural thin ideal (Dittmar, 2005; Leahy, Crowther,

& Mickelson, 2007; Wood, 2006). It is considered an outward manifestation of thin ideal internalization and an active process in which women engage.

Fat talk is extremely common on college campuses (Ousley, Cordero, & White, 2008), which perhaps explains why this variable predicted disordered eating across the sample – not just for sorority women. It is recognized as a normative behavior and both men and women anticipate body self-derogation as the most common response by women in conversation related to the body (Britton et al., 2006). The present research suggests that fat talk has lasting negative effects for those who engage in this form of self-talk .In this study, fat talk at the beginning of the academic year predicted increasing levels of disordered eating at the end of the academic year. Although the intended effect of fat talk for the short-term may be to make women momentarily feel better about their body, it appears that this behavior may actually be linked to behavioral outcomes (i.e., disordered eating).

Social Cognitive Theory (Bandura & Walter, 1963; Miller & Dollard, 1941) proposes that individuals actively interpret, shape, and reify the social worlds that they encounter. Both the individual and environment interact to produce motivation and behavior. In the context of the college environment, women must chose with which groups they will identify and how they interpret their social environment. With a social environment that endorses thinness, fat talk may be a way that women actively, behaviorally reify the thin ideal and the social norms and roles imbued in it. In this way, fat talk may therefore represent a proximal social comparison that becomes part of the reciprocal determinism proposed by Social Cognitive Theory. In other words, reciprocal interactions between the person, environment, and behavior are interrelated and influence

pathology. Fat talk appears to be an important variable in this interaction that affects the development of disordered eating. Interestingly, sorority and group norms did not predict increased disordered eating over time. However, personal values emerged as a significant longitudinal predictor of disordered eating. It may be that the importance of social norms have already been established in adolescence (Bulik, 2002), which is why groups norms did not have as great of an effect as personal values regarding the body and thinness on disordered eating. By the time women attend college, the thin ideal norm may be so pervasive among the entire population of women that group norms are not as influential in regard to the body because *all groups* generally tend to endorse this thin ideal norm. On the other hand, personal values regarding the body and thinness refer not only to *what is* in society, but how important these social norms are to the individual.

Alternatively, it may be that a developmental perspective may be beneficial in the interpretation of why personal values appear to be more predictive of disordered eating trajectories than social norms in college women. Adolescence and the high school years are the typical time for the onset of eating disorders (Bulik, 2002). During this time, girls are particularly vulnerable to developing disordered eating attitudes and behaviors. One recent study found that 61% of adolescent girls demonstrated unhealthy weight loss behaviors (Hudson et al., 2007). The high school years are a transition to adulthood and an important developmental period for establishing eating habits and weight-related beliefs (Kolbe, Kann, & Collins, 1993). Research has shown that body and weight-related cognitions developed during this time tend to persist across the lifespan and are difficult to change (Kolbe et al., 1993). Bulimia in particular appears to be problematic, with bulimic symptoms increasing between the ages of 14 and 16 (Lewinsohn et al., 2002).

Gender socialization and societal body objectification have been linked to disordered eating in youth (Grunbaum et al., 2006; Kraemer, & Kupfer, 2006), and many of these types of social messages are transmitted by peers and family (Markey, 2004). Personal values regarding the body and thinness may have been developed during this time period through the influence of social norms and messages, and they may be a powerful predictor of future disordered eating. By the time women are in college, the influence of social norms – which may have been more important during the high school years – may not be as influential as the personal values that promote disordered eating.

Personal values are beliefs that guide behavior and influence one's evaluation of others' behaviors and events (Bilsky & Schwartz, 1994). They can be conceptualized as a meeting point between characteristics of the individual and characteristics of the culture to which the individual belongs. In effect, personal values reflect both cultural norms and individual differences. The personal values that the present study captures are those that involve the body and thinness. Personal values regarding the body and thinness predicting increased disordered eating over time could be considered a reflection of a culmination of thin ideal internalization, social norms, cultural context, and individual differences that comprise one's personality. The present study suggests that personal values regarding the body and thinness predict disordered eating above and beyond thin ideal internalization alone, as well as social norms, which is a novel contribution to the literature.

Finally, it is noteworthy that sorority membership was not significantly associated with disordered eating at baseline or over time, since the popular press and social convention highlights the putatively negative effects concerning sorority life on body

image and disordered eating. Little is known about the longitudinal effects of sorority membership in the current literature on sorority women, and this research is the first to examine multiple sororities, in comparison to a control group of non-sorority women, over the course of an entire academic year. Sorority women have been conceptualized as having a preoccupation with body image and appearance (Basow et al., 2007) and research has supported this conclusion. However, past literature has been largely cross-sectional, conducted during a limited time frame, or has not included a control group. Recruitment in these studies has largely consisted of targeted sororities or for course credit (Crandall, 1998; Landa & Bybee, 2007). In effect, previous studies may have been biased in nature. The present study addresses these limitations and found that previous conclusions drawn regarding differences between sorority and non-sorority women on eating and body pathology may be premature. Contrary to prior research, the current study found that sorority and non-sorority women do not differ on levels of disordered eating at both single time points and longitudinally. This result is opposed to other work, such as Schulken and Pinciaro's (1997) research indicating that sorority members show increased body image disturbance and body dissatisfaction compared to the general college population. The present study's methodological advances, including multiple time points and a control group, likely illustrate a more accurate representation of eating and body pathology in sorority and non-sorority women.

In the past, sorority women may have differed from non-sorority women on levels of disordered eating as previous research suggests. However, much of the research on sorority women that suggests these differences was conducted over a decade ago (i.e., Alexander, 1998; Crandall, 1988; Schulken & Pinciaro, 1997). With the thin ideal

becoming more and more pervasive in society, it may be that non-sorority women have grown to espouse the thin ideal to the same degree as sorority women. Thus, this thin ideal norm and the accompanying body dissatisfaction and disordered eating may be common for all groups of women, not just those groups who have traditionally been more at-risk. In other words, sorority membership may not be as important as in prior research, as the thin ideal has become more ubiquitous in Western culture where everyone is exposed to these influences, not just sorority women.

The second set of hypotheses examined the interactions between individual predictors of disordered eating over time. The sorority and group social norms questionnaires regarding the body and thinness revealed similar factor structures and were combined into one social group norm variable. *Hypothesis 2.1* predicted that personal values will moderate the relationship between sorority/group norms and disordered eating, *Hypothesis 2.2* predicted that body dissatisfaction will moderate the relationship between sorority/group norms and disordered eating, and *Hypothesis 2.3* predicted that body dissatisfaction will moderate the relationship between personal values and disordered eating.

Hypotheses 2.1, 2.2, and 2.3 were partially supported. Personal values did not moderate the relationship between sorority/group norms and disordered eating. Body dissatisfaction did not moderate the relationship between sorority/group norms and disordered eating. However, body dissatisfaction did moderate the relationship between personal values and disordered eating. For participants with high levels of body dissatisfaction, higher levels of personal values regarding the body and thinness significantly predicted disordered eating trajectories. However, this relationship was not

significant for women with lower levels of body dissatisfaction. That is, for women with lower levels of body dissatisfaction, personal values regarding the body and thinness did not significantly predict eating disorder trajectories. The present research suggests that those with high levels of personal values regarding the body and thinness, as well as high levels of body dissatisfaction, are most at risk of developing disordered eating over time. Given that this study found that personal values were a predictor of disordered eating trajectories and body dissatisfaction is one of the most robust predictors of clinical eating disorders (Anton, Perri, & Riley, 2000; Cash & Deagle, 1997; Ricciardelli, Tate, & Williams, 1997; Riva, Marchi, & Molinari, 2000; Stice, 2002; Stice & Agras, 1998), it is not surprising that these relationships exist.

The present research highlights the fact that the relationship between body dissatisfaction and disordered eating may be more refined than it has typically been depicted in the literature. Past literature has identified moderating factors in the relationship between body dissatisfaction and eating – among them, depression, anxiety, and dieting (Juarascio, Perone, & Timko, 2011). The current work illustrates the importance of personal values. In general, moderator effects help to identify cases where the effect of body dissatisfaction has an even more powerful effect on disordered eating. This study suggests that among those who have body dissatisfaction, those who have high personal values regarding the body and thinness may be even more at risk for body pathology.

Social-Cognitive Mechanisms Predicting Disordered Eating in Sorority Women

The second goal of this research was to investigate social norms, group identification, thin ideal internalization, and social comparison as mechanisms through

which disordered eating develops over time within the sorority group. One moderated mediation cross-lag panel model was used to investigate the following hypotheses: *Hypothesis 3.1* predicted that over time, social norms of sorority women are expected to be associated with disordered eating, such that more body-focused social norms will be associated with more disordered eating, *Hypothesis 3.2* predicted that over time, thin ideal internalization is expected to be associated with disordered eating, such that higher thin ideal internalization will be associated with more disordered eating, *Hypothesis 3.3* predicted that the impact of social norms on disordered eating is expected to be significantly reduced after controlling for the thin ideal internalization mediator variable, and *Hypothesis 3.4* predicted that the mediation relationship of social norms, thin ideal internalization, and disordered eating is expected to vary by level of identification to one's sorority.

These hypotheses were not supported by the results of this study. After inspection of the moderated mediation cross-lag panel model, the only significant findings concerned social norms, disordered eating, and sorority identification. These variables significantly predicted their own occurrence at subsequent time points (i.e., Time 1 predicted Time 2, Time 2 predicted Time 3). Thin ideal internalization significantly predicted Time 2 from Time 1, but Time 3 was only marginally predicted by Time 2.

A second moderated mediation cross-lag panel model was used to investigate the following hypotheses: *Hypothesis 4.1* predicted that over time, social norms of sorority women are expected to be associated with disordered eating, such that more body-focused social norms will be associated with more disordered eating, *Hypothesis 4.2* predicted that over time, fat talk is expected to be associated with disordered eating, such

that more fat talk will be associated with more disordered eating, *Hypothesis 4.3* predicted that the impact of social norms on disordered eating is expected to be significantly reduced after controlling for the fat talk mediator variable, and *Hypothesis 4.4* predicted that the mediation relationship of social norms, fat talk, and disordered eating is expected to vary by level of thin ideal internalization.

The second set of moderated mediation cross-lag panel model hypotheses were also not supported. Similar to the first model, the only significant findings concerned variables predicting themselves at future time points. The social norms, fat talk, disordered eating, and thin ideal internalization variables significantly predicted their own occurrence at subsequent time points (i.e., Time 1 predicted Time 2, Time 2 predicted Time 3).

Several explanations exist for why hypotheses 3 and 4 were not supported. Although the variables predict their own occurrence at subsequent time points for each model, an examination of the variable means indicated that the variables in the models did not significantly vary over time. Thus, the variables did not increase or decrease over time and show longitudinal change. Many of the variables are also highly correlated, which may impact the statistical analyses. Lastly, poor fit of the models may be explained by the lack of key variables not included in the model. Perhaps certain variables left out, such as body dissatisfaction or other constructs not measured by this study, would have contributed to a better fitting model. For example, the Tripartite Influence Model of body image and eating disturbance (Thompson, Coovert, & Stormer, 1999) has been supported in the literature as a way of conceptualizing sociocultural influences in the development of disordered eating (Coomber & King, 2008; Van de Berg, Thompson, Obremski-

Brandom, & Coovert, 2002). This model posits that peers, parents, and the media are three primary sources of influence that affect body and eating pathology in women. Perhaps the present study could have been strengthened by the incorporation of parent and media variables, which are often included in sociocultural research. Additionally, the incorporation of a variable that assesses appearance-focused social comparisons, in addition to the fat talk variable, may have aided the fit of the model.

Of note, fat talk was a significant predictor of disordered eating trajectories in the hierarchical linear modeling analysis (hypothesis 1.3) while it was not a significant predictor in the structural equation model analyses (hypotheses 3 and 4). This finding may be explained by the fact that the hierarchical linear modeling analysis used fat time at time 1 to predict disordered eating over time, whereas the structural equation modeling analyses used fat talk at all three time points and allowed many of the predictors in the models to correlate. Thus, the different analyses used the variables in slightly different ways, likely altering the outcomes for each. Additionally, the samples for the two types of analyses were different. The hierarchical linear modeling analysis used both sorority and non-sorority women, whereas the structural equation modeling analyses used only the sorority group.

Evidence for Scale Validation

Although not initially a primary aim of this study, it is worth mentioning that the three measures created for this study – sorority social norms, group social norms, and personal values regarding the body and thinness – showed evidence of validation through the analyses used in this study. These measures are new to the literature and capture

interesting constructs that could be useful for future research. In the following section, these three measures will be discussed.

Sorority and group social norms. Convergent and discriminant validity, as well as test-retest reliability, were demonstrated for the sorority and group social norms measures.

Convergent validity. Scores on the sorority and group social norms measures were generally strongly correlated with scores on a measure of fat talk across all three time points. These results demonstrate convergent validity, as it was expected that these measures would be related.

Discriminant validity. Discriminant validity was demonstrated through non-significant associations between the sorority and group social norms measures and scores on the positive affect scale. These scales were not expected to correlate with one another, either positively or negatively.

Test-retest reliability. The sorority social norms scale showed temporal stability as evidenced by the correlation coefficients across time points 1, 2, and 3. The group social norms scale also showed temporal stability as evidenced by the correlation coefficients across time points 1, 2, and 3.

Personal values regarding the body and thinness. Convergent, discriminant, and incremental validity, as well as test-retest reliability, were proven in this study.

Convergent validity. Scores on the personal values regarding the body and thinness measure were strongly correlated with scores on thin ideal internalization and body dissatisfaction across all three time points. These results demonstrate convergent validity, as it was expected that these measures would be related.

Discriminant validity. Discriminant validity was demonstrated through non-significant associations between the personal values regarding the body and thinness measure and scores on the positive affect scale. These scales were not expected to correlate with one another, either positively or negatively.

Incremental validity. The personal values regarding the body and thinness measure was used in the HLM analyses predicting disordered eating. This measure predicted significant variance in disordered eating beyond that predicted by thin ideal internalization and body dissatisfaction. These results suggest that this measure was associated with unique variance in disordered eating and demonstrates incremental validity over other measures of body pathology.

Test-retest reliability. The personal values regarding the body and thinness measure showed temporal stability as evidenced by the correlation coefficients across time points 1, 2, and 3.

Importance of the development and validation of new measures. The social and group social norms measures and the personal values regarding the body and thinness scale are valuable contributions to the literature on body and eating pathology. The only other scale to date measuring peer norms is by Giles and colleagues (2007) and was created for their study but not subjected to a factor analysis or validation efforts. This scale was also designed for measurement of norms of close friends, whereas the measure that was created in this study assessed norms both in one's general peer group as well as a specific group (one's sorority).

The personal values regarding the body and thinness measure is the first of its kind and can be conceptualized as the extent to which thin ideal internalization has been

incorporated into one's core beliefs and given importance in one's life. This measure shows predictive validity above and beyond a measure of thin ideal internalization. The personal values regarding the body and thinness measure could be useful in future studies on body and eating pathology, in addition to measures of body dissatisfaction, thin ideal internalization, and social comparison.

Limitations, Summary, & Conclusions

The present research is one of the first to extend the literature beyond examining individual differences, such as body dissatisfaction and self-esteem, and investigate social factors in the development of disordered eating over time. In fact, this study incorporates both individual differences and social influences in conjunction. This study has three main findings. First, sorority women did not differ from non-sorority women on eating pathology. Second, fat talk and personal values regarding the body and thinness predict increased disordered eating over time in the general college population of women. Third, the sorority and group social norms scale, as well as the personal values regarding the body and thinness measure, were all developed and showed evidence for validation in this research.

The current study has several limitations. The first limitation concerns the preliminary research questions. When examining the three measures created in this research, it was found that the scales were highly correlated with one another. The personal values regarding the body and thinness measure was positively correlated with the sorority group norms measure, $r(233)=.33$, $p < .001$. Additionally, the personal values regarding the body and thinness measure was positively correlated with the primary social group norms measure, $r(313)=.50$, $p < .001$. Although the measures were positively

correlated, which suggests that the scales could potentially be evaluating overlapping constructs, it is somewhat expected that they would share variance as similar constructs are being measured. However, these scales are conceptually unique, in that personal values are individual and other two scales measure group constructs. The group constructs are different because one is designed for sorority women whereas the other is designed for one's primary social group. Thus, the scales may overlap, but are ultimately conceptually different.

The next limitations of this study concern the main hypotheses. Although a large number of women were included from two Midwest universities, the entire sorority community at these universities was not reached. Only three of the five sororities at Loyola University Chicago and two of the twelve sororities at Northwestern University chose to participate in this study. Other sororities were captured through individual participation via online listservs. Future research could better capture a more diverse sample of sorority women from universities across the country. Another limitation may have been the sorority women in this study were those who agreed to participate. Thus, sororities that have body-toxic cultures may not have participated due to the negative image that this participation might promote. Future research could address this potential sampling bias by participation from sorority women from all sororities at the university being studied.

On a related note, this study had only a small number of participants complete all three time points. For example, in one structural equation model in this study, only 127 women completed all three time points. This number can be in part explained by the rush process, as for one of the universities participating in this study, rush was conducted

halfway through the school year. In turn, there was an increase in the total number of sorority women in time points 2 and 3 due to the increase in sorority membership.

Another limitation is that this study only examined college women, and the results may only be generalizable to this population. An interesting extension to this study would be to investigate women not enrolled in college as a control group to determine if similar disordered eating patterns are found. It would also be worthwhile to lengthen the timeframe of this study and examine time away from college, such as during a summer break. Perhaps a break in exposure from college peers and residence halls may impact body and eating pathology. College residence halls are a context for the socialization of bulimic symptomatology. Spending more time with peers is associated with greater pathology whereas time away is associated with a decrease in symptomatology (Zalta & Keel, 2006).

Another individual-difference variable that may add a contribution to this model but that has not often been studied in relation to body and eating pathology is self-concept clarity. Self-concept clarity is the extent to which an individual's perceived personal attributes are clearly and confidently defined, internally consistent, and temporally stable (Campbell, Trapnell, Heine, Katz, Lavallee, & Lehman, 1996). Women with low self-concept clarity may be more likely to internalize the thin ideal and engage in appearance-related comparisons, as they do not have a strong sense of identity. Indeed, self-concept clarity has been shown to be negatively correlated with appearance comparison and thin ideal internalization (Vartanian, 2009). Thus, this variable would be an interesting incorporation to the hypothesized models in this study.

Lastly, the current study did not discriminate between injunctive versus descriptive social norms. Instead, social norms were described as one all-inclusive concept for the body and thinness. Future research on the sorority and group social norms scales that were developed in this study could work to separate injunctive versus descriptive norms.

This research has applications for college women and eating disorders treatment in general. Fairburn's (2008) enhanced cognitive behavior therapy is one of the leading eating disorders treatment models and acknowledges the role that social comparison and body image disturbance play in maintaining these disorders. Fat talk is one type of overt and active social comparison that is worthwhile to target, especially given the findings that it is a large predictor of disordered eating over time. Working on women's core beliefs regarding the thin ideal could also work to change and improve women's personal values regarding the body and thinness.

The present body of work also illustrates that eating disorder prevention efforts should be targeting the entire population of college women, not only women who have been traditionally considered at-risk. As the thin ideal becomes more and more pervasive in Western culture, it is clear from this study that the entire population of women are at risk. Current eating disorder prevention efforts and programming tend to utilize cognitive dissonance and target thin ideal internalization by having women speak and behave in ways that counter this ideal (Stice, Mazotti, Weibel, & Agras, 2000; Stice & Presnell, 2007). The present study supports these efforts, as actively countering the thin ideal may improve women's tendency to engage in fat talk, which leads to disordered eating long-term.

In sum, this research found that disordered eating affects college women and fat talk and personal values regarding the body and thinness are important factors in the development of this pathology. Three new social norms and values measures were also created. The thin ideal is pervasive in Western culture, and only with more research can treatment and prevention efforts become more effective.

APPENDIX A

PRESENT STUDY MEASURES

Social Norms

Think of the 5 people (non-family) that you spend the most time with while you are at school. Of these 5 friends, how many are in your sorority (primary social group for non-sorority women)?
Number: _____

How much do you identify with your sorority (primary social group for non-sorority women)?

I do not identify with my sorority at all	1	2	3	4	5	6	7	I identify with my sorority very much

Think about your own attitudes and values. **How much do you personally value**…
(Circle one number for each)

	Not at all 1	2	3	4	5	6	Very much 7
Thinness	1	2	3	4	5	6	7
Physical appearance	1	2	3	4	5	6	7
Dieting	1	2	3	4	5	6	7
Exercising	1	2	3	4	5	6	7
Fitting in with a social group	1	2	3	4	5	6	7

Think of your sorority in general. **How much does your sorority (primary social group for non-sorority women) value**…
(Circle one number for each)

	Not at all 1	2	3	4	5	6	Very much 7
Thinness	1	2	3	4	5	6	7
Physical appearance	1	2	3	4	5	6	7
Dieting	1	2	3	4	5	6	7
Exercising	1	2	3	4	5	6	7
Fitting in with a social group	1	2	3	4	5	6	7

Thin Ideal Internalization

Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.

	Definitely Disagree	Mostly Disagree	Neither Agree Nor Disagree	Mostly Agree	Definitely Agree
	1	2	3	4	5
1. TV programs are an important source of information about fashion and "being attractive."	1	2	3	4	5
2. I've felt pressure from TV or magazines to lose weight.	1	2	3	4	5
3. I do not care if my body looks like the body of people who are on TV.	1	2	3	4	5
4. I compare my body to the bodies of people who are on TV.	1	2	3	4	5
5. TV commercials are an important source of information about fashion and "being attractive."	1	2	3	4	5
6. I do not feel pressure from TV or magazines to look pretty.	1	2	3	4	5
7. I would like my body to look like the models who appear in magazines.	1	2	3	4	5
8. I compare my appearance to the appearance of TV and movie stars.	1	2	3	4	5
9. Music videos on TV are not an important source of information about fashion and "being attractive."	1	2	3	4	5

10. I've felt pressure from TV and magazines to be thin.	1	2	3	4	5
11. I would like my body to look like the people who are in movies.	1	2	3	4	5
12. I do not compare my body to the bodies of people who appear in magazines.	1	2	3	4	5
13. Magazine articles are not an important source of information about fashion and "being attractive."	1	2	3	4	5
14. I've felt pressure from TV or magazines to have a perfect body.	1	2	3	4	5
15. I wish I looked like the models in music videos.	1	2	3	4	5
16. I compare my appearance to the appearance of people in magazines.	1	2	3	4	5
17. Magazine advertisements are an important source of information about fashion and "being attractive."	1	2	3	4	5
18. I've felt pressure from TV or magazines to diet.	1	2	3	4	5
19. I do not wish to look as athletic as the people in magazines.	1	2	3	4	5
20. I compare my body to that of people in "good shape."	1	2	3	4	5
21. Pictures in magazines are an important source of information about	1	2	3	4	5

fashion and "being attractive."					
22. I've felt pressure from TV or magazines to exercise.	1	2	3	4	5
23. I wish I looked as athletic as sports stars.	1	2	3	4	5
24. I compare my body to that of people who are athletic.	1	2	3	4	5
25. Movies are an important source of information about fashion and "being attractive."	1	2	3	4	5
26. I've felt pressure from TV or magazines to change my appearance.	1	2	3	4	5
27. I do not try to look like the people on TV.	1	2	3	4	5
28. Movie stars are not an important source of information about fashion and "being attractive."	1	2	3	4	5
29. Famous people are an important source of information about fashion and "being attractive."	1	2	3	4	5
30. I try to look like sports athletes.	1	2	3	4	5

Body Dissatisfaction

Below are a series of statements that describe people. Please rate how much you agree that the statement below describes you.						
	Never 1	Rarely 2	Sometimes 3	Often 4	Usually 5	Always 6
1. I think my stomach is too big.	1	2	3	4	5	6
2. I think that my thighs are too large.	1	2	3	4	5	6
3. I think that my stomach is just the right size.	1	2	3	4	5	6
4. I feel satisfied with the shape of my body.	1	2	3	4	5	6
5. I like the shape of my buttocks.	1	2	3	4	5	6
6. I think my hips are too big.	1	2	3	4	5	6
7. I think that my thighs are just the right size.	1	2	3	4	5	6
8. I think that my buttocks are too large.	1	2	3	4	5	6
9. I think that my hips are just the right size.	1	2	3	4	5	6

Disordered Eating

Please check one response for each of the following statements:

	Always	**Usually**	**Often**	**Some times**	**Rarely**	**Never**
1. I am terrified about being overweight.	1	2	3	4	5	6
2. I avoid eating when I am hungry.	1	2	3	4	5	6
3. I find myself preoccupied with food.	1	2	3	4	5	6
4. I have gone on eating binges where I feel that I may not be able to stop.	1	2	3	4	5	6
5. I cut my food into small pieces.	1	2	3	4	5	6
6. I am aware of the calorie content of foods that I eat.	1	2	3	4	5	6
7. I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)	1	2	3	4	5	6
8. I feel that others would prefer if I ate more.	1	2	3	4	5	6
9. I vomit after I have eaten.	1	2	3	4	5	6
10. I feel extremely guilty after eating.	1	2	3	4	5	6
11. I am preoccupied with a desire to be thinner.	1	2	3	4	5	6
12. I think about burning up calories when I exercise.	1	2	3	4	5	6
13. Other people think that I am too thin.	1	2	3	4	5	6
14. I am preoccupied with the thought of having fat on my body.	1	2	3	4	5	6
15. I take longer than others to eat my meals.	1	2	3	4	5	6
16. I avoid foods with sugar in them.	1	2	3	4	5	6
17. I eat diet foods.	1	2	3	4	5	6
18. I feel that food controls my life.	1	2	3	4	5	6
19. I display self-control around food.	1	2	3	4	5	6
20. I feel that others pressure me to eat.	1	2	3	4	5	6
21. I give too much time and thought to food.	1	2	3	4	5	6

22. I feel uncomfortable after eating sweets.	1	2	3	4	5	6
23. I engage in dieting behavior.	1	2	3	4	5	6
24. I like my stomach to be empty.	1	2	3	4	5	6
25. I have the impulse to vomit after meals.	1	2	3	4	5	6
26. I enjoy trying new rich foods.	1	2	3	4	5	6

Fat Talk

When talking with your friends, how often do you **say** things like…

Remember, we're not interested in how often you have **thoughts** like this. Instead, we're interested in how often you **say** things like this out loud when you're with your friends. Even if you wouldn't use these exact words, we're interested in whether you say similar things (that mean the same thing) when you're with your friends.

When talking with your friends, how often do you **say** things like…

Never	**rarely**	**occasionally**	**sometimes**	**frequently**	**usually**	**always**
1	**2**	**3**	**4**	**5**	**6**	**7**

Please circle one number per question.

1	I wish my body looked like hers.	1	2	3	4	5	6	7
2	I need to go on a diet.	1	2	3	4	5	6	7
3	I feel fat.	1	2	3	4	5	6	7
4	She has a perfect stomach.	1	2	3	4	5	6	7
5	This outfit makes me look fat.	1	2	3	4	5	6	7
6	Why can't my body look like hers?	1	2	3	4	5	6	7
7	She has a perfect body.	1	2	3	4	5	6	7
8	I need to start watching what I eat.	1	2	3	4	5	6	7
9	She's in such good shape.	1	2	3	4	5	6	7
10	I wish I was thinner.	1	2	3	4	5	6	7
11	I wish my abs looked like hers.	1	2	3	4	5	6	7
12	I think I'm getting fat.	1	2	3	4	5	6	7
13	You never have to worry about gaining weight.	1	2	3	4	5	6	7

Positive and Negative Affect

This scale consists of a number of words that describe different feelings and emotions. Read each item and then underline the appropriate number in the space next to that word.

Indicate to what extent you feel this way <u>in general</u>.

		very slightly or not at all	a little	moderately	quite a bit	extremely
1. interested		1	2	3	4	5
2. distressed		1	2	3	4	5
3. excited		1	2	3	4	5
4. nervous		1	2	3	4	5
5. upset		1	2	3	4	5
6. strong		1	2	3	4	5
7. guilty		1	2	3	4	5
8. scared		1	2	3	4	5
9. hostile		1	2	3	4	5
10. enthusiastic		1	2	3	4	5
11. proud		1	2	3	4	5
12. irritable		1	2	3	4	5
13. alert		1	2	3	4	5
14. ashamed		1	2	3	4	5
15. inspired		1	2	3	4	5
16. determined		1	2	3	4	5
17. attentive		1	2	3	4	5

18. jittery		1	2	3	4	5
19. active		1	2	3	4	5
20. afraid		1	2	3	4	5

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